

THE JOURNAL
OF THE
ROYAL AGRICULTURAL
SOCIETY OF ENGLAND

VOLUME 84

(BEING THE EIGHTY-FOURTH VOLUME ISSUED SINCE THE
FIRST PUBLICATION OF THE JOURNAL IN 1839)

PRACTICE WITH SCIENCE

LONDON:
JOHN MURRAY, ALBEMARLE STREET
1923

EXTRACT FROM THE SOCIETY'S BYE-LAWS

(Dating from the Foundation of the Society) :—

“The Society will not be responsible for the accuracy of the statements or conclusions contained in the several papers in the Journal, the authors themselves being solely responsible.”

TABLE OF CONTENTS.

VOLUME 84, 1923.

PORTRAIT OF SIR ERNEST CLARKE, M.A., F.S.A.
Facing Page 1.

SPECIAL ARTICLES.

	PAGE
Sir Ernest Clarke	1
By J. AUGUSTUS VOELCKER, M.A., B.Sc., Ph.D.	
The Laying Down of Land to Grass	11
By PROFESSOR WILLIAM SOMERVILLE, M.A., D.Sc.	
Stock-Farming on Arable Land	29
By W. R. PEEL, M.A., D.S.O.	
Crops for Ensilage	39
By A. W. OLDERSHAW, N.D.A.	
The Silage Content of Tower Silos and Silage Clamps	50
By ARTHUR AMOS, M.A.	
Beef Production	60
By Professor T. B. WOOD, M.A., F.R.S.	
The Economical Adjustment of Air Space in Cow Sheds	73
(With Two Illustrations)	
By W. G. V. GLOSSOP.	
Light Horse Breeding	79
By CHARLES RICHARDSON.	
Poultry-Keeping on the Farm	93
By C. A. HOUSE.	
The Woburn Experimental Farm and its Work (1876-1921)	110
By J. AUGUSTUS VOELCKER, M.A., B.Sc., Ph.D.	

RESEARCH WORK BY THE SOCIETY.

Experiments with Cereals in Norfolk	166
By C. HEIGHAM.	
The Merits of Home-Produced Foods for Pig-Feeding	174
By CHARLES CROWTHER, M.A., Ph.D., and W. S. CHALMERS, B.Sc.(Agr.), B.Com.	

CONTEMPORARY AFFAIRS.

Contemporary Agricultural Law	199
By AUBREY J. SPENCER, M.A.	
Agricultural Statistics, 1923	211
By R. E. STANLEY.	

	PAGE
NOTES, COMMUNICATIONS AND REVIEWS.	
Reports of the Departmental Committee on Distribution and Prices of Agricultural Produce	230
"Food Production in War," by Thomas Hudson Middleton, K.B.E.	231
"Foundations of Agricultural Economics," by J. A. Venn, M.A.	233
"Farm Implements and Machinery," by J. R. Bond, M.Sc.	236
"Equipment for the Farm and the Farmstead," by H. C. Ransome	237
"The Book of Alfalfa," by F. D. Coburn	238
The Society's Gold Medal for Agricultural Research	239
OFFICIAL REPORTS.	
The Newcastle Show, 1923	240
By T. B. TURNER	
Miscellaneous Implements Exhibited at the Newcastle Show, 1923	248
(With Three Illustrations)	
By WILLIAM BURKITT.	
Report of the Steward of Dairying, Newcastle Show, 1923	260
By ERNEST MATTHEWS, C.V.O., LL.D.	
Agricultural Education Exhibit, Newcastle, 1923	279
The Forestry Exhibition at the Newcastle Show, 1923	285
By W. H. BENNETT.	
Report of the Judges on the Plantations and Estate Nurseries Competitions, 1923	291
Report of the Judges on the Orchard and Fruit Plantation Competition, 1923	306
Report of the Council to the Annual General Meeting of Governors and Members of the Society, December 12, 1923	312
Reports on the Results of the Examinations in 1923 for— (1) The National Diploma in Agriculture ; (2) The National Diploma in Dairying	326
Annual Report for 1923 of the Principal of the Royal Veterinary College	336
By PROFESSOR SIR JOHN MCFADYEAN, M.B., B.Sc., C.M.	
Annual Report for 1923 of the Consulting Chemist	347
By J. AUGUSTUS VOELCKER, M.A., B.Sc., PH.D.	
Annual Report for 1923 of the Botanist	358
By PROFESSOR R. H. BIFFEN, M.A., F.R.S.	
Annual Report for 1923 of the Zoologist	362
(With Five Illustrations)	
By CECIL WARBURTON, M.A., F.Z.S.	
The Work of the Agricultural Relief of Allies Committee.	37
By J. P. GOODWIN.	

APPENDIX.

	PAGE
List of Council of Royal Agricultural Society of England	i
Standing Committees of the Council	iii
Chief Officials of the Society	v
Distribution of Governors and Members of the Society, and of Ordinary Members of the Council.	vi
Table showing the Number of Governors and Members in each Year from the Establishment of the Society	vii
Financial Statement by the Chairman of the Finance Committee	viii
Statement of Receipts and Expenditure at the Newcastle Show, 1923	x
Balance-sheet for 1923, with Statement of Receipts and Payments for the year 1923	xiv
Research Committee: Receipts and Payments for the year 1923	xviii
Trust Funds held by the Royal Agricultural Society	xix
Minutes of the Council Meetings in 1923	xx
January 31, xx; March 7, xxii; April 11, xxv; May 2, xxvii; June 6, xxix; July 4, xxx; August 1, xxxvii; November 7, xl; December 12, xliii.	
Proceedings at the General Meeting in the Newcastle Show-yard, July 4, 1923	xxxi
Proceedings at the Annual General Meeting, December 12, 1923	xlvi
Awards of Prizes at Newcastle Show, 1923	lvii
Principal Additions to the Library	cl
Index to Volume 84	clii
Statement of Privileges of Membership	i
Form of Application for Membership	ix
Index to Advertisers (at end)	24

Binding of Back Volumes of the Journal.

THE JOURNAL is issued this year to Governors and Members bound in paper covers, and Messrs. BUTLER & TANNER LTD. have contracted to bind this and back Volumes to match the Bound Volumes issued by the Society from 1901-4, and 1912-14, at the rate of 3s. 6d. per Volume, and to supply the green cloth lettered cases, for the use of local bookbinders, at the price of 1s. 9d. each, post free, or 1s. 6d. each if called for at their offices. Cases cannot, however, be supplied separately for the Volumes of the First and Second Series, 1839 to 1889.

All parcels and correspondence relative to the binding of back numbers of the Journal should be addressed (postage or carriage prepaid) to Messrs. BUTLER & TANNER LTD., The Selwood Printing Works, Frome, Somerset.

To avoid confusion the Volumes of the Journal have been renumbered from the beginning, and the following Table shows both the Old and the New Numbers of each of the Volumes which have been issued since the first appearance of the Journal in 1839:-

NEW NUMBERS		OLD NUMBERS		NEW NUMBERS		OLD NUMBERS	
FIRST SERIES				SECOND SERIES—continued.			
Vol. 1.	1839-40	Vol.	I. Parts I. (1), II. (II), III. (III), and IV. (iv).	Vol. 44.	1889	Vol. XIX.	Parts I. (xxvii) and II. (xxviii).
" 2.	1841	"	II. " I. (v), II. (vi) & III. (vii).	" 45.	1884	" XX.	" I. (xxix) and II. (xxx).
" 3.	1842	"	III. " I. (viii) and II. (ix).	" 46.	1885	" XXI.	" I. (xxxii) and II. (xxxiii).
" 4.	1843	"	IV. " I. (x) and II. (xi).	" 47.	1886	" XXII.	" I. (xxxiv) and II. (xxxv).
" 5.	1844	"	V. " I. (xii) and II. (xiii).	" 48.	1887	" XXIII.	" I. (xxxvi) and II. (xxxvii).
" 6.	1845	"	VI. " I. (xiv) and II. (xv).	" 49.	1888	" XXIV.	" I. (xxxviii) and II. (xxxix).
" 7.	1846	"	VII. " I. (xvi) and II. (xvii).	" 50.	1889	" XXV.	" I. (xli) and II. (xlii).
" 8.	1847	"	VIII. " I. (xviii) and II. (xix).	THIRD SERIES			
" 9.	1848	"	IX. " I. (xx) and II. (xxi).	Vol. 51.	1890	Vol.	I. Parts I. (1), II. (2), III. (3), & IV. (4).
" 10.	1849	"	X. " I. (xxii) and II. (xxiii).	" 52.	1891	" II.	" I. (5), II. (6), III. (7), & IV. (8).
" 11.	1850	"	XI. " I. (xxiv) and II. (xxv).	" 53.	1892	" III.	" I. (9), II. (10), III. (11), & IV. (12).
" 12.	1851	"	XII. " I. (xxvi) and II. (xxvii).	" 54.	1893	" IV.	" I. (13), II. (14), III. (15), & IV. (16).
" 13.	1852	"	XIII. " I. (xxviii) and II. (xxix).	" 55.	1894	" V.	" I. (17), II. (18), III. (19), & IV. (20).
" 14.	1853	"	XIV. " I. (xxxi) and II. (xxxii).	" 56.	1895	" VI.	" I. (21), II. (22), III. (23), & IV. (24).
" 15.	1854	"	XV. " I. (xxxiii) and II. (xxxiv).	" 57.	1896	" VII.	" I. (25), II. (26), III. (27), & IV. (28).
" 16.	1855	"	XVI. " I. (xxxv) and II. (xxxvi).	" 58.	1897	" VIII.	" I. (29), II. (30), III. (31), & IV. (32).
" 17.	1856	"	XVII. " I. (xxxviii) and II. (xxxix).	" 59.	1898	" IX.	" I. (33), II. (34), III. (35), & IV. (36).
" 18.	1857	"	XVIII. " I. (xxxi) and II. (xl).	" 60.	1899	" X.	" I. (37), II. (38), III. (39), & IV. (40).
" 19.	1858	"	XIX. " I. (xli) and II. (xlii).	" 61.	1900	" XI.	" I. (41), II. (42), III. (43), & IV. (44).
" 20.	1859	"	XX. " I. (xliiii) and II. (xliiv).	" 62.	1901		Issued as an Annual Bound Volume.
" 21.	1860	"	XXI. " I. (xlii) and II. (xli).	" 63.	1902		Issued as an Annual Bound Volume.
" 22.	1861	"	XXII. " I. (xlii) and II. (xli).	" 64.	1903		Issued as an Annual Bound Volume.
" 23.	1862	"	XXIII. " I. (xli) and II. (xli).	" 65.	1904		Issued as an Annual Bound Volume.
" 24.	1863	"	XXIV. " I. (xli) and II. (xli).	" 66.	1905		Issued as an Annual Volume in paper cover.
" 25.	1864	"	XXV. " I. (xli) and II. (xli).	" 67.	1906		Issued as an Annual Volume in paper cover.
SECOND SERIES				" 68.	1907		Issued as an Annual Volume in paper cover.
Vol. 26.	1865	Vol.	I. Parts I. (1) and II. (II).	" 69.	1908		Issued as an Annual Volume in paper cover.
" 27.	1866	"	II. " I. (III) and II. (iv).	" 70.	1909		Issued as an Annual Volume in paper cover.
" 28.	1867	"	III. " I. (v) and II. (vi).	" 71.	1910		Issued as an Annual Volume in paper cover.
" 29.	1868	"	IV. " I. (vii) and II. (viii).	" 72.	1911		Issued as an Annual Volume in paper cover.
" 30.	1869	"	V. " I. (ix) and II. (x).	" 73.	1912		Issued as an Annual Bound Volume.
" 31.	1870	"	VI. " I. (xi) and II. (xii).	" 74.	1913		Issued as an Annual Bound Volume.
" 32.	1871	"	VII. " I. (xiii) and II. (xiv).	" 75.	1914		Issued as an Annual Bound Volume.
" 33.	1872	"	VIII. " I. (xv) and II. (xvi).	" 76.	1915		Issued as an Annual Volume in paper cover.
" 34.	1873	"	IX. " I. (xvii) and II. (xviii).	" 77.	1916		Issued as an Annual Volume in paper cover.
" 35.	1874	"	X. " I. (xix) and II. (xx).	" 78.	1917		Issued as an Annual Volume in paper cover.
" 36.	1875	"	XI. " I. (xxi) and II. (xxii).	" 79.	1918		Issued as an Annual Volume in paper cover.
" 37.	1876	"	XII. " I. (xxiii) and II. (xxiv).	" 80.	1919		Issued as an Annual Volume in paper cover.
" 38.	1877	"	XIII. " I. (xxv) and II. (xxvi).	" 81.	1920		Issued as an Annual Volume in paper cover.
" 39.	1878	"	XIV. " I. (xxvii) and II. (xxviii).	" 82.	1921		Issued as an Annual Volume in paper cover.
" 40.	1879	"	XV. " I. (xxix) and II. (xxx).	" 83.	1922		Issued as an Annual Volume in paper cover.
" 41.	1880	"	XVI. " I. (xxxi) and II. (xxxii).	" 84.	1923		Issued as an Annual Volume in paper cover.
" 42.	1881	"	XVII. " I. (xxxiii) and II. (xxxiv).				
" 43.	1882	"	XVIII. " I. (xxxv) and II. (xxxvi).				

(The numerals within brackets indicate line numbers as printed on the several Parts of each Series.)



Yours sincerely
Armed Forces

JOURNAL

OF THE

ROYAL AGRICULTURAL SOCIETY OF ENGLAND

SIR ERNEST CLARKE.

For a period of nineteen years, 1887-1905, there were few names better known in the agricultural world than that of Ernest Clarke. Unknown previously to agriculture, and, it must be added, to a great extent forgotten afterwards, Clarke was one of those men of natural gifts and determination who succeed in adapting themselves, by sheer ability, to the circumstances in which they find themselves placed.

For he was, indeed, a remarkable man, and one gifted in many different directions; and though unlike his immediate predecessor, the late H. M. Jenkins—in that Clarke never became, as did Jenkins, an agricultural authority—yet, as Secretary of the premier Agricultural Society, he made his influence felt in a most marked manner during his tenure of the office.

Clarke was a Suffolk man, born at Bury St. Edmunds on February 21, 1856, the second son of J. J. Clarke of that town. Anything that had to do with the Eastern Counties, and with Suffolk in particular, had a special attraction for him, and in literary circles he rendered good service by his researches into the chronology and archaeology of his native district. For the same reason, doubtless, he was specially drawn to the late A. J. Smith, of Rendlesham, a member of the R.A.S.E. Council, who, on the few occasions of his addressing the Council, could only be clearly followed by one conversant with the true Suffolk "speech."

In presenting Clarke to the Chancellor of Cambridge University, for the honorary degree of M.A. in 1894, the Public Orator (the late Sir John Sandys) referred to Clarke's Suffolk connection, and to his researches in agricultural literature, describing him as the "Arthur Young of the present day."

Arthur Young was himself a Suffolk man, and this reference to his native county was specially pleasing to Clarke.

As a boy, Clarke attended the Guildhall Middle School at Bury St. Edmunds, and at the early age of thirteen distinguished himself by passing the Cambridge Junior Local Examination, gaining the first place in English and French. He followed this up by taking, in the following year, the Cambridge Senior Examination, passing with distinction in English. At the age of sixteen he entered the open competition for the Civil Service, and obtained the second place on the whole list, being thereafter (1872) assigned to the Medical Department of the Local Government Board. In this sphere he had, as successive chiefs, Sir John Simon, Dr. Edward Seaton, and Sir George Buchanan. With the last named of these he was particularly friendly, and to this friendship may in measure be due the relations which he maintained with such men as Sir Ernest Hart, Sir Lauder Brunton, Sir Donald Macalister and others. It was while at the Local Government Board, doubtless, that Clarke acquired not only those powers of organisation which he afterwards showed so highly, but also the ideas of centralisation which he developed in his administration of the R.A.S.E., and the "official style" from which, in business matters, he was never quite free.

He continued at the Local Government Board from 1872 to 1881, having in 1880 married Marguerite, the second daughter of James Prevost of Leghorn, a lady of much charm and grace, who, though having but indifferent health and entering but little into public life, was a true companion and helper of one pursuing the active and absorbing career that her husband followed. She died in May, 1918, leaving no family.

In 1881 he left the Civil Service for the City, to take up the duties of Assistant Secretary in the Share and Loan Department of the Stock Exchange. The secretary of this department was Sir Henry Burdett, and, under him, Clarke was mainly responsible for the compilation of the well-known *Burdett's Official Intelligence*. This, Clarke was often heard to say, was a very strenuous time and not the happiest period in his life, so that when, in 1887, he applied for, and obtained, from among 106 candidates (many of them already known in agricultural circles) the post of Secretary of the Royal Agricultural Society of England, the change of sphere was one that he gladly welcomed. Clarke's selection for this post was, to many, a matter of surprise, for he possessed no agricultural qualifications, except perhaps that he came from an agricultural county—Suffolk! Nor could he be said to be "scientific"; his predecessor, H. M. Jenkins, had moved in scientific circles, and then rapidly adapted himself to agricultural surroundings, whereas Clarke had always been, and remained, indeed, the "office" man. But his brilliant early career, his

success wherever he had been, his knowledge of French and thorough acquaintance with English literature, proved strong assets, and he was elected as Secretary.

Clarke was not long in finding his way in his new duties, and his coming was soon marked by a thorough reorganisation of the work of the office, the introduction of the latest labour-saving methods, and a perfecting of the sources of reference and general information on such agricultural matters as might, from time to time, come forward. Not that this had been neglected before, but, just as Jenkins had been more the "agricultural reporter" and "outside" man, going here and there to study this and that question, and leaving the conduct of routine office business to subordinates, so Clarke became essentially the "indoor" man, and devoted himself mainly to the work of organisation and of strengthening the Society from within. In this he displayed unbounded energy, and the results of his innovations were speedily shown, the work of the office being soon raised to a very high standard of efficiency. It meant harder work and longer hours for the Staff than they had been accustomed to, but Clarke, if dictatorial and hasty at times in his manner, earned their respect, while he, in return, was ever ready to devise some new means of adding to their comfort and improving their position, so that, on the whole, he was liked by them, and they were always his loyal supporters.

But Clarke was very much more than the head of the Staff, or the executive officer of the Council. He was a man of large ideas and endowed with energy and determination to carry them out. His aim in his new position was to make the R.A.S.E. the one great "power" in the agricultural world, and to this end he strove, and succeeded, moreover, in imbuing many of the Council with the same views. In this way he would tolerate no encroachment by other organisations, public or private, in the sphere which he felt the "Royal" ought to fill. But, more than this, Clarke was a man of wide and not merely insular views, and he endeavoured to make the R.A.S.E. better known and more looked up to on the Continent, in America, and abroad generally. Thus, he entered into relations with foreign correspondents, cultivated the acquaintance of men of mark—alike in agriculture and in science—and was ever ready to further any movement by which he thought the Society would acquire benefit or "kudos." Among such may be mentioned his visit to Austria in 1890, as official representative of the Society to the International Agricultural Congress in Vienna, which resulted in the article which he wrote, for the *Journal* of the Society, on the Agricultural Administration in Austria-Hungary, and his delegation to the similar Congress at the Paris Exhibition of 1900, when he gave a popular lecture

on British Live Stock, this including the transference, by moving pictures, of the R.A.S.E. Show Yard to Paris. He also advocated my visit, as the Society's Consulting Chemist, to India in 1889, on deputation for the Government of India; while further visits were promoted to Germany and elsewhere for the purpose of investigating the pot-culture system of experimentation on plants, for enquiry into "nitragin" and other nitrogen-assimilating methods, for reporting on sugar-beet cultivation in Austria (1891), etc. This kind of work had previously been done by the late Secretary in his individual capacity, and many were the able and well-written reports with which Jenkins had enriched the Society's *Journal*, but Clarke made such enquiries part of an organised system, and endeavoured to interest other workers in it. Similarly, he took part himself in the gatherings of educational and scientific bodies, taking care that the Society was duly represented at them. In short, though no scientist himself, and not an agriculturist either, Clarke had that appreciation of the aid which science could bring to the cause of agriculture, which was embodied in a faithful carrying out of the intentions of the founders of the Society, as expressed in its motto, "Practice with Science." He clearly saw that such a Society as the "Royal" had a much larger function to fulfil than that of providing an annual show of live stock and implements, world-wide though the reputation of this was. Other societies, both national and local, were doing much the same, though on a smaller scale, and Clarke recognised that if the Society was to make any real progress, and take the lead to which its unique position entitled it, it must pay more attention to the educational and the scientific side of its work.

With this in view he was largely instrumental in the formation of the National Agricultural Examination Board, into which were merged the formerly separate examinations of the R.A.S.E. and the Highland and Agricultural Society of Scotland; he attended, on behalf of the Society, conferences on agricultural education, and assisted in the formation of the School of Agriculture at Cambridge University, and the institution of the Gilbey Lectureship there.

For a time he combined with the office of Secretary that of Editor of the Society's *Journal*, and at intervals there appeared articles from his pen. These mostly took the form of memoirs of noted agriculturists or of deceased members of the Council, all written with a marked grace of expression and pleasant presentation of the main facts of each life. Among his articles may be mentioned "The Foundation of the Royal Agricultural Society of England" (1890), "Agriculture and the House of Russell" (1891), "John, Lord Somerville" (1897), "The Board

of Agriculture, 1793-1822" (1898), "Philip Pusey," and "Francis, Duke of Bedford" (1901).

His memoirs of deceased members of Council and others included those of John Algernon Clarke, John Coleman, Charles Randall, J. Chalmers Morton (1888), the Duke of Devonshire (1891), Sir James Caird (1892), Sir Harry Verney (1894), Hermann Hellriegel (1895), and the Duke of Richmond and Gordon (1903).

He gave up the editorship of the *Journal* in 1893, Dr. Fream being then appointed in his place. Fream was followed in this office in 1901 by E. H. Godfrey (now an officer of the Canadian Government), who, shortly after Clarke's appointment, became his right-hand man and faithful helper.

It was rather in the "executive" field, however, that his brilliancy was shown, and in the drawing up of reports, minutes, memoranda, etc., and in preparing the work to be done by the various committees of the Council. He was a ready thinker, a quick worker, and a master at grasping and dealing with the details of any situation that arose, sparing neither time nor trouble in acquainting himself with the facts. With this he possessed that ability to deal with any new or difficult situation which made him invaluable to the different chairmen of committees, and led them, with few exceptions, to rely largely upon him.

If there was any function to be performed, or any ceremonial to be arranged, Clarke was in all such matters a "past master," and he could be depended upon to leave nothing undone, but to carry all out in just the way that it should be done. Full of resource, gifted with the power of knowing intuitively whom to enlist, he combined with this a courtesy and brightness of spirit that ensured success. Those who were privileged to take part in it will never forget the magnificent gathering at St. James's Palace when, on the occasion of the Society's Jubilee (1889), Her Majesty Queen Victoria, as President, entertained the Council at a banquet at which King Edward VII (then Prince of Wales) presided. And there were many other functions, some of an important public nature, others of a more social and free and easy type such as the musical entertainments got up by the office Staff (in which he himself took a leading part), all of which told of his goodwill and buoyancy of spirit, and brought out his high musical and social gifts. It was wonderful indeed how, after enduring a heavy strain of work and responsibility, Clarke could throw this off and become the soul of any social gathering.

He early set about providing the Society with a house and official quarters more worthy of it, and the somewhat plain quarters at 12, Hanover Square, were exchanged for the luxurious rooms at Harewood House next door. Here the Society had a

magnificent council chamber, spacious offices and committee rooms. Under his care the library, which had hitherto been somewhat neglected, was reorganised and enriched with early classical works on agriculture, whilst to the Society's existing collections were added old and valuable prints, and other objects of interest which Clarke's antiquarian tastes led him to acquire.

Nor were the interests of the Society's annual show neglected by him; during his secretaryship it assumed, as an exhibition, greater proportions than ever, and marked improvements were effected in its organisation.

Clarke, as stated, on taking up the secretaryship rapidly adapted himself to the new surroundings; to the outside world he soon became the embodiment of the Society, and was recognised as its leading spirit. Honours came thick upon him; in 1894 he received the honorary degree of M.A. at Cambridge University on the occasion of the Society's meeting in that town. In 1896 he became the first Gilbey Lecturer there, and devoted himself during the three years' course to a review of agricultural writers of the past, bringing to this the results of his own researches, and in the course of which he had occasion to expose, in a most pleasant way, many of the then current fallacies and misstatements. He showed that many of these had occurred through one writer copying the mistakes of another, and, among other things, he proved conclusively that the *Boke of Husbandry* was written by John Fitzherbert, the landowner, and not (as maintained by the late Professor Skeat, of Cambridge) by his younger brother Anthony Fitzherbert, the lawyer. He became at this time a member of St. John's College, Cambridge; from foreign countries he received numerous distinctions, "Chevalier Ordre du Mérite Agricole" from France, honorary membership of the Société Nationale d'Agriculture de France, and honorary membership of national Agricultural Societies in France, Germany, Austria, Hungary, Italy, the Argentine, etc. In January, 1898, he received the honour of knighthood, in recognition of his services to agriculture.

And then, as it were, at the height of his influence, came the change which ended in his retirement in 1906 from the service of the Society.

For a considerable time the annual shows of the Society had been a matter of growing concern. The increasing demands for space and the greater outlay necessitated without adequate return, coupled with the difficulty of getting suitable sites in populous towns where the public would attend in large numbers, had been brought home to the Council who, after the successful show at Manchester (1897), had to face three considerable losses in succession (Birmingham, Maidstone, York). This obliged

them in 1899 to reconsider the whole position of the show system. A special committee was formed which reported to the Council, in February, 1900, in favour of the abandonment of the migratory system and the establishment of a permanent show ground in the vicinity of the Metropolis. It is not necessary in this memoir to discuss the *pros* and *cons* but only to trace the movement so far as it affected Clarke. The decision once made by the Council, and by the large majority of thirty-four votes to four (March, 1900), Clarke became the active prosecutor of it and set himself to carry it out to the utmost of his powers. Into it he put all his energy, and the way in which the work was accomplished in time to open Park Royal Show in 1903 is a striking testimony to his zeal and strength of purpose. But, as is now well known, such a change as that introduced was not made without strong opposition. Moreover, the great mistake had been made of not taking the opinion of the members of the Society generally on the proposal. Many old friends of the Society openly opposed it, many others stood aloof, and there was a marked want of that unanimity which was so essential to success. The real responsibility for this rested with the Council, not with Clarke, although it is generally believed that he strongly advocated the proposed change. Looking at matters now in the light of subsequent events, it is comparatively easy to conclude that the decision was a mistake, and yet there are still those who think, and not without reason, that, had the change been properly "worked," and had the general body of members been consulted, the result might have been very different. As it was, the Council, relying on their majority, and having in Clarke one who they knew would carry the matter through, resolved on forcing their views, and without taking the general body of members throughout the country into account. Clarke's fault, if fault it was, consisted in relying too much upon his Council, and when, at a later date, the disaster of Park Royal had shown the unwisdom of the change, the men who had supported him, and whose instructions he had faithfully carried out, failed to stand by him in the critical hour, and the coming in of a new regime, following on the enquiry of a special committee in October, 1905, brought his connection with the Society to a close. Clarke had himself in some measure contributed to this, for a certain brusqueness of manner, and a disposition to cultivate the "great" and ignore the "small," led to his becoming unpopular with a large number of the members, who showed their resentment by refusing to have anything to do with Park Royal, or by becoming open opponents of the Council's action. Clarke's failings were those of the man who felt his own strength and who reckoned that, with his Council behind him, he would be able to carry anything through. Had the

Council supported him throughout, his future might have been very different.

In yet another direction Clarke was at fault, viz., in pushing his ideas of centralisation to the extent of curtailing the liberty and independence of action of those who were his colleagues—the consulting officers of the Society. Each of these, whether editor, veterinary officer, chemist, botanist, or engineer, had his own committee to whom he was directly responsible, but Clarke's aim was, while rightly bringing the whole work into line, to make, in effect, each department and each consulting officer subservient to himself, and this led to considerable heart-burnings and to some resignations. But of all, or nearly all the officers, it could be said that, though officially they might be at variance with Clarke, and though he at times made their position extremely difficult, this was never allowed to interfere with the personal relations and regard which existed between him and his colleagues.

The report of the special committee appointed on August 1, 1905, to consider the whole position of the Society was adopted by the Council on October 4. It recommended the abandonment of Park Royal as a show ground, a return to the migratory system of shows, the sale of Harewood House, and other economies, besides the resignation of the whole office Staff and the appointment of a Secretary at a lower salary.

Clarke accepted the opportunity given him to send in his resignation, which took effect as from the close of 1905, he being given an Honorarium of £1,000, and being made an Honorary Member of the Society. From this date he disappeared from agricultural circles, and there were but one or two of his associates in the Society who ever kept in touch with him, or who more than just remembered the great services he had rendered. To himself the blow was one attended with much mortification, and it is not to be wondered at that he smarted severely under a sense of the ingratitude shown him. Nevertheless, to the last he retained his interest in the Society, keeping in touch with its doings, and, even when completely laid aside by illness, his conversations often reverted to the days that were among the happiest of his life.

After a time he returned to the City and began again to interest himself in commercial and financial matters, but this was now no easy matter, and not much success, and often much to harass, attended these efforts. The death of his wife in May, 1918, deprived him of one whose companionship had ever been a great help and solace to him, and after this he was never the same man. Within six months of this date he himself had a paralytic "stroke," and from November, 1918, until his death, on Sunday, March 4, 1923, he was altogether confined to his room. During all this weary time he was assiduously looked after by a

faithful old servant of the family, Eliza Davis, who stayed with him to the end; while occasionally a few of his old colleagues and associates would come to see him. Up to within a week of the close he retained absolute clearness of mind, and a wonderfully retentive memory, and to those, such as myself, who came to visit him, he was still the same "power" as of old, save as regards the body.

The funeral service was held on Wednesday, March 7, at Christ Church, Woburn Square, when, owing to the simultaneous and unavoidable sitting of the R.A.S.E. Council, it was only possible for Colonel E. V. V. Wheeler and myself to attend as representatives of the Society. The interment took place at Finchley Cemetery.

Clarke was, as has been already observed, a man of remarkable power and energy. In frame he was tall, big, and somewhat loosely set together. On Clarke's first introduction to the Council, the late Charles Howard—a noted judge of stock—was heard to remark that the new Secretary was not a good "mover"! In no sense was he athletic, nor did he ever seriously take up any particular form of physical exercise. His gifts were social, musical, literary, biographical, and organising. In private life few could be more courteous, kindly, or afford better company. He was a splendid conversationalist, and by his wide experience, by his erudition and his knowledge of human nature, he made his influence felt wherever he was. Added to this was the *savoir-faire* of the "man of the world," and the ability to adapt himself to every condition that arose. I who had the pleasure of paying not a few visits in his company, remember specially his astuteness, when going to stay at some country house of note, in priming himself beforehand in the main facts of interest regarding the history, the architecture, or the ancestry of the house he was about to visit. Arrived there, one felt he knew more about the place than did the inmates themselves! On the occasion of the Society's visit to Cambridge in 1894, and when the guest of Masters of Colleges and great University officers, Clarke showed the same tact in preparing himself beforehand as to the distinctions and peculiarities of those he was going to meet, and many were the stories he used to relate of his experiences. With these and similar narrations Clarke would keep a company regaled, and it was the same at the gatherings of the "Sette of Odd Volumes" and of the "Confrères," at each of which he was a familiar and welcome figure.

Of the "Sette of Odd Volumes" he became a member in 1892, and president in 1898-9, his part being that of the "Yeoman." He was chairman of the committee of the London Society of East Anglians (1899-1900), member of the Cambridge Antiquarian Society, and of the Suffolk Archaeological Society, a

fellow of the Society of Antiquaries (F.S.A.), of the Linnean Society (F.L.S.), and of the Royal Statistical Society (F.S.S.), and a member of the Hon. Society of Gray's Inn. He was also a Foundation Member and President (1910-11) of the Chartered Institute of Secretaries. In civic life he belonged to three Worshipful Companies, viz., the Musicians, the Farriers, and the Glovers, becoming Master of the last named in 1904-5. He was also a member of the Junior Carlton Club.

He interested himself greatly, along with Robert Newman, in the Sunday Concert Society, and lectured to it on "The Music of the Countryside" and on "May Day in Merrie England." To the programmes of these concerts he frequently contributed descriptive and biographical notes, the result of considerable research: many of these had to do with the origin and authorship of national songs.

When the Great War broke out he took an active part as a member of the Grand Committee of the National Guard. In earlier life he had belonged to the Civil Service Rifles, and now became Hon. Company Commander of the D (Secretaries) Company of the 2nd Battalion of the National Guard, which company he had been instrumental in forming.

To his various honours he was able to add personal marks of regard accorded to him by Royalty. Her Majesty Queen Victoria, in 1889, after the Windsor Jubilee Show, when she was president of the Society, wrote to Clarke a letter, in her own handwriting, expressing her thanks for the arrangements made during her presidency. In 1903 the present King, when Prince of Wales, and after serving as president of the R.A.S.E., presented Clarke with a diamond scarf pin, a gift which he greatly prized.

In the domain of history, biography and literature his principal contributions were: (1) in 1901, *Bury Chronicles of the Thirteenth Century*, in which he successfully combated the Roman Catholic theory that the bones of St. Edmund were taken to Toulouse, and thence sent, with the blessing of the Pope, to Westminster Cathedral; (2) in 1903 a new edition of the *Chronicle of Jocelin of Brakelond*, a picture of monastic life in the days of Abbot Samson. In addition he wrote several articles for the *Dictionary of National Biography*, as well as the *Memoirs* in the *Journal R.A.S.E.* to which reference has already been made.

Such was the varied and busy career of a man of remarkable power, who, during the time of his prosperity, showed great activity and wielded a strong influence, and who, though in the later years of his life he suffered an eclipse, must ever be remembered for his loyalty to the Royal Agricultural Society, and for what he did to maintain and extend its influence.

J. A. VOELCKER.

1, Tudor Street,
London, E.C. 4.

THE LAYING DOWN OF LAND TO GRASS.

THIS is a subject which is always of more or less importance in agriculture, but at the present time it is an especially pressing problem. There are wide areas of land in this country which cannot possibly be kept profitably under tillage under the present economic conditions, and relief must be found either along the line of temporary leys or of permanent pasture.

There is no essential difference in the composition of mixtures for use on a temporary ley, down for three or four years, as compared with one for use on permanent pasture, although no doubt in the latter case additional cost may be justified, and a larger quantity of seed and a greater number of species may be employed.

In considering the plants which are used for laying away land to grass we may divide them into annuals, biennials and perennials. In the first group are included those which mature in the year in which the seed is sowed, and therefore their presence in a permanent pasture can only be through the agency of self-sown seed. Such a plant is *Poa annua*, quite a common plant on thin pastures and a very usual weed in gardens. Another is Trefoil, which although a truly annual plant, is quite common, and, in fact, very abundant in many cases on thin, permanent pasture, especially on the Downs. About the month of March or April one often sees myriads of the seedlings of this plant springing up on thin Down pasture, and under certain circumstances the plant must have considerable value.

Biennials are defined as plants which produce their seed in the year after they are sowed, and to this group belong Italian Ryegrass and Broad Red Clover. Such plants can only establish themselves by seed.

Perennial plants are those which persist year after year. They spread either by seed or by underground or surface-rooting stems, technically known as stolons or rhizomes. Most of the plants in a permanent meadow or pasture belong to this group, as, for instance, Wild White Clover, Wild Red Clover, Kidney Vetch, Cocksfoot, and most of the Fescues.

Again, plants may be defined as top and bottom species, according as they are tall or dwarf. The top grasses give bulk to the crop, while the bottom grasses fill up the interspaces below and add largely to the leafage of the herbage.

It may be well to run through the more important species of plants met with in our pastures and meadows and to give the more salient features of each. These are taken more or less in alphabetical order.

THE INDIVIDUAL PLANTS.

The Grasses.

Bent grasses or Fiorin belong to the genus *Agrostis* and are a common constituent of many permanent grass fields, being frequently the predominant feature of upland meadows and pastures. Perhaps the commonest Bent grass is the one known as Creeping Bent, *Agrostis stolonifera*, which is characterised by the production of long stolons, and which on tillage land is known as Water grass. There it spreads exactly like Twitch and is equally difficult to eradicate, except that it is more susceptible to drought, and therefore a summer fallow in a dry year will usually get rid of it. It is essentially a bottom grass, pushing its stems through the herbage and rooting at the nodes. It is one of the later grasses and grows far into autumn, which is perhaps its chief recommendation. If pasture containing this grass is left rough, snow is apt to flatten it during winter, when the lower part of the stem becomes partially decayed and unpalatable to stock. In no case, however, is it much appreciated by animals, and it is not to be recommended for inclusion in any permanent mixture. At Rothamsted it was found to be greatly stimulated by ammonium sulphate, a manure that encourages all shallow-rooted grasses.

Cocksfoot, *Dactylis glomerata*, is certainly one of the best pasture plants that we possess. It comes early, flowering in the beginning of June, is highly nutritious, is relished by stock, and gives a large yield. It is distinctly a top grass, under favourable circumstances attaining to a height of 4 ft. It suits land with a fair amount of moisture better than a very dry soil. In the latter case it is apt to become hard and unpalatable. In a meadow where Cocksfoot predominates the hay should be cut rather early, or otherwise the hard flower heads will somewhat reduce the value of the crop. When sown it develops early and is therefore of great value in temporary leys which are intended for use for three or four years. When sowed sparingly in a mixture it is apt to give a very tufty appearance to the pasture, but if a sufficient quantity of the seed is introduced this tufty appearance is not so evident. No grass springs so quickly after being cut, and therefore it bulks largely in the aftermath of a hay field. There are several strains of Cocksfoot on the market, some of which are more leafy than others, and these are naturally better for pastures and meadows than those which are characterised by producing strong flowering stems. Cocksfoot from New Zealand is generally credited with producing a large quantity of leaves and is therefore on the whole one of the best strains for use in this country.

Crested Dogtail, *Cynosurus cristatus*, is a very common

plant in many pastures. It is essentially a bottom grass, seldom attaining to a height of more than a foot and a half. It is not an early grass, but continues to grow late into the autumn. It suits almost any soil, but grows best in a somewhat heavy one, if not too wet. It revels in a humid atmosphere and is therefore more abundant in upland pastures than under other circumstances. It is perhaps more associated with sheep pastures than with cattle runs. If allowed to shoot up it produces a very hard head and a tough flowering stem, which is not only unpalatable to stock but may be positively dangerous. If hungry cattle are allowed to eat large quantities of the flowering stems they are apt to have digestive troubles, known as stomach staggers, which may in some cases prove fatal. To prevent the flowering stems shooting up, a pasture containing much Crested Dogtail should be closely grazed in early summer. The seed is good and fairly cheap, and a small quantity ought to be introduced into most permanent mixtures.

Of the Fescues there are several distinct species, one of the commonest being Meadow Fescue, *Festuca pratensis*, which may be called a top grass, attaining to a height of about 2 ft., or more. This plant suits moist soil best, and it is no use sowing it on dry, light land. It takes some years to establish itself, and is therefore unsuited for temporary leys.

A variety of this plant is the Tall Fescue, a much stronger growing plant than Meadow Fescue, which is recommended for use in mixtures intended for meadows. Another—Sheep's Fescue—is a very common plant on thin, dry soil, especially on the Downs. This is an admirable plant, resisting drought well and being much appreciated by sheep. The leaves, instead of being flat are rolled inwards, by which means evaporation is retarded and consequently it is a plant which is very resistant to drought. It is a true bottom grass, and is quite unsuited to a meadow or to any situation where strong grasses predominate, where it would quickly be choked out. But for use on thin, dry, hot chalk this grass deserves to be favourably considered.

Another similar grass is Hard Fescue, which is regarded merely as a variety of Sheep's Fescue. Here the leaves are broader and longer, and the plant gives more bulk to herbage. Like the other it is essentially a bottom grass. On the whole, perhaps it is a better grass for introduction to a mixture, and in point of fact many seedsmen do not appear to attempt to keep the two species distinct.

Foxtail, *Alopecurus pratensis*, is a tall grass attaining to a height of 4 ft. It is a very valuable grass in a meadow or permanent pasture, provided there is sufficient moisture in the soil, but it is not at all suited to dry land. It flowers very early and makes much of its growth during the month of May. It is

especially suitable for growing in orchards, because it bears shade well, and also owing to the fact that much of its growth is made before trees come into leaf. If the land is suitable, a small quantity of the seed of this plant may be introduced into a mixture for permanent purposes. There are two other species of *Alopecurus* of interest to agriculturists, namely *A. agrestis*, which is known as Black Bent and is a common and troublesome weed of strong tillage land. Another species, *A. geniculatus*, affects wet land and is, like the last, a weed.

Of Meadow Grasses belonging to the genus *Poa* there are two which are especially worthy of notice, namely, Smooth-stalked Meadow Grass, *P. pratensis*, and Rough-stalked Meadow Grass, *P. trivialis*. Smooth-stalked Meadow Grass is a plant that affects light soil, but it is never a common constituent of any permanent pasture, so infrequently, in fact, does it occur there as to make its inclusion in a seed mixture unjustifiable. Rough-stalked Meadow Grass, on the other hand, is a very common constituent of permanent leys, and is in every respect a much superior grass to the other. Both are essentially bottom grasses, that is to say, the bulk of the leafage is fairly close to the ground. A small quantity of the seed of this species may be introduced for a permanent ley where the conditions of the soil seem to suit it.

These two plants are very similar in appearance and in habit, and are distinguished by the fact that in the case of Rough-stalked Meadow Grass the ligule or scale at the base of the leaf blade is long and pointed; whereas in the case of Smooth-stalked Meadow Grass it is short and blunt. The two plants may also be distinguished by drawing a flowering stem between the lips, when the Rough-stalked Meadow Grass, as the name implies, will be found to be much rougher than the other.

Of Oat Grasses, genus *Avena*, there are several which deserve a passing word. Yellow Oat Grass, *Avena flavescens*, is a common constituent of the herbage of thin, hot, dry soil. It suits the chalk Downs well and in a dry season it is often one of the most prominent grasses there. It may be recommended for introduction under these circumstances, provided the seed can be got at a reasonable price, but unfortunately this is often scarce and dear.

Tall Oat Grass, *Avena elatior*, is a top grass, attaining to a height of 4 ft. It is highly appreciated on the continent where it is known as French Ryegrass, but in this country it occupies a rather subordinate place amongst the farmer's list of plants. It has, however, the advantage of giving a large bulk of herbage and of growing under dry conditions, and seeing that the seed can be got fairly cheap it is worthy of a place in many mixtures. A variety of this particular species is known as Onion Grass on account of the fact that the underground stem swells up in a

series of knots, like strings of small onions, and is very difficult to eradicate from tillage land. A common plant on thin, dry chalks is *Avena pratensis*, Meadow Oat Grass, which grows to a height of about 2-3 ft., but appears to be rather unpalatable and not much appreciated by stock. A variety of this species, *Avena pubescens*, common on chalk, is also a plant of insignificant importance.

The Ryegrasses are on the whole the most important species of all. Of these there are two that require special mention, namely, Italian Ryegrass and Perennial Ryegrass. Italian Ryegrass is a purely biennial plant, that is to say, one sows it in the spring of one year and reaps the produce in the next season. It is therefore specially adapted for use in a one year's ley, and for this purpose it is one of the most valuable grasses we have. It is a top grass of a rather tufty habit, which gives a large yield of aftermath and can sometimes be cut more than twice in a season. It also suits irrigation well, especially with sewage or liquid manure. It prefers strong loam, or if the soil is light it must contain sufficient moisture.

Perennial Ryegrass is on the whole the more valuable species. It is hardier than Italian Ryegrass and is thoroughly perennial under many circumstances. About forty years ago a controversy raged about the value of Perennial Ryegrass in a pasture, opinion being sharply divided as to its perennial character, or otherwise. There are, however, innumerable examples in the country of grass land that has been down for many years where Perennial Ryegrass is the main constituent. It seems to prefer soil that is fairly consolidated, and for this reason is better adapted for pastures than for meadows. It is also found to be much more abundant along a footpath than in other parts of the field. It is a grass that is highly appreciated by stock both as hay and as pasture, and ought to form the bulk of most mixtures whether for temporary or for permanent purposes.

It may be mentioned that a species of *Lolium*, namely, *L. temulentum* or Darnel Grass, is a fairly common weed of tillage land and supposed to be poisonous to stock.

Timothy? *Phleum pratense*, is one of our more important grasses and is largely used for sowing down land to permanent pasture, and especially for meadows. It attains to a height of 3 or 4 ft. and is distinctly a top grass. It is one of our later grasses, not flowering till about the end of June. Its main advantages are that it gives a large yield of fairly good quality, and is hardy and unfastidious in character. It suits peaty land better than any other good grass, though it prefers a moist, deep loam. It is no use sowing it on dry, light land, although another species, *P. bulbosum*, is a very common constituent of

the herbage of thin chalk. This bulbous-rooted Timothy only grows to a height of 3 or 4 in., and looks like a dwarf variety of the common Timothy, but on lifting a plant out of the ground it is found that the base of the stem is somewhat swollen, hence the name. Common Timothy is largely used in the south of Scotland for putting down pure for meadows. The yield of hay obtained from such meadows is very large, often running up to 4 tons an acre. Being a late grass it does not bulk largely in the aftermath. On account of the seed being cheap and of high quality, and, moreover, the seed being very small—there are four times as many grains in a pound as in the case of many other species—it is desirable to introduce this plant wherever the conditions are satisfactory for growth.

Sweet-scented Vernal, *Anthoxanthum odoratum*, is one of our very earliest grasses, coming into flower at the same time as Foxtail. It is a low-growing bottom grass which is a common constituent of the herbage of upland pastures, although it is also met with in pastures of low-lying fields. The yield it gives is small and it is not much appreciated by cattle or sheep, and is certainly not to be recommended for sowing under ordinary circumstances.

The above are the more important grasses of our meadows and pastures, though other grasses—of which there are about 100 species in the British Isles—are also met with. Couch grass or Twitch, or Quickens, is too well known to require any description. Fortunately it is essentially a weed of tillage land and does not persist in permanent pasture. Tussock grass or Bull's-snouts is another grass which is common enough in many pastures, where it disfigures the appearance of the herbage by growing in strong dense tussocks. These are often laboriously dug out by hand, but if treated with basic slag or other phosphatic manure it will be found that they are often eaten down quite bare.

There are two Meadow Barley grasses which should be mentioned, namely, *Hordeum murinum* and *H. pratense*. The former is a common wayside weed of a hard unpalatable character, while the latter is a very common constituent of many pastures. It is known popularly as Squirrel-tail and, although regarded as a weed and not worthy to be introduced in a mixture, is found to be very abundant in some of the fine pastures of Somerset. A common grass on poor moorland pastures is Quaking Grass, or Silver Shackles, which, however, cannot be regarded as having any value.

The Brome Grasses are also common constituents of many pastures, *Bromus mollis* being very frequently met with on thin, chalky land. *Bromus sterilis* is a very frequent weed on tillage land where it is often known as Lop Grass. All the native

Bromes are considered to be undesirable plants and unworthy of introduction artificially.

Yorkshire Fog is another grass which is considered to be bad, although in point of fact it is met with in many good permanent grass fields. It frequently appears in great abundance in the second and third year after the land is laid away to grass, when it crowds out the better plants and prevents their establishment.

THE LEGUMINOUS PLANTS.

Of leguminous plants there are several that are of first-class importance in laying down land to grass.

Broad Red Clover is a plant which is largely used for short leys but is not a true perennial, disappearing from most fields in the course of two or three years. It prefers strong land, well drained, and containing a sufficient quantity of lime. It is very susceptible to clover sickness, and on many soils cannot be grown more often than once in six years. Where, however, it succeeds it leaves the land very rich in nitrogen and gives a large and valuable aftermath.

Red Clovers which are more perennial are Cow Grass, Welsh, Cornish Marl, and Late Flowering Red. These plants, and others of a similar character, do not give so much aftermath as Broad Red Clover, but they are more persistent. Some seeds are of a better strain than others, and it is well to go to a firm of known reputation in order to secure a reliable strain. There is a Red Clover that grows along the roadsides and other waste places called Zig-Zag Clover, which spreads by underground stems and is extremely persistent, but unfortunately stock are not fond of it and, moreover, its seed is not on the market. During the last two or three years seedsmen have been giving attention to Wild Red Clover seed, a certain amount of which can now be purchased, and it may be expected to be more persistent than the cultivated forms.

White, or Dutch Clover, has long been known as a valuable ingredient of a mixture. Unfortunately the common white clover is not thoroughly perennial, but for a short ley is a valuable plant. It is not very tall and is therefore better adapted for pastures than for hay fields. Of late years much attention has been given to the cultivation of Wild White Clover. This is a plant that is thoroughly persistent and is a most valuable acquisition to our list of pasture plants. Most people have seen the effects of putting phosphates on poor grass land, and the wonderful development of Wild White Clover that follows. It rapidly spreads by surface-rooting stems and fills up a pasture very quickly. The appearance of the seed of this plant on the market has greatly simplified the laying away of land to per-

manent pasture, and it is now recognised as being the most valuable single ingredient of a mixture. It is also largely used for temporary leys of three or four years' duration, and it has been found to leave the land very rich in nitrogen, which becomes available for a succeeding crop. Unfortunately the seed is rather dear, but this year it appears to be purchasable at 10s. a pound, or less, at which price at least 1 lb. in a seed mixture is thoroughly justifiable.

Alsike Clover is also a useful plant for alternate leys, although not thoroughly perennial. It grows better on wettish land than any other clover, and is also fairly resistant to clover sickness.

Trefoil, or, as it is sometimes called, Yellow Clover, is an annual plant which, however, under many circumstances persists through the agency of self-sown seed. It revels in strongest land rich in lime and grows best in a dryish climate. The seed is cheap and good, and even in a permanent mixture may often be introduced with advantage.

Birdsfoot Trefoil is a native plant met with on permanent pastures, the seed of which is available on the market. It responds well to basic slag, fields in some cases being quite yellow with its flower.

Kidney Vetch is another plant met with on thin chalks and dry soil generally, which is thoroughly perennial and a useful addition to a mixture on thin soils. It also responds well to phosphatic dressings.

MISCELLANEOUS PLANTS.

Of miscellaneous plants we have Burnet, a native plant which grows well on thin, poor, chalky soil. It is very deep-rooted and therefore resists drought well, and ought to be included in a mixture for use under these circumstances.

Rib Grass is recommended by some, but it is doubtful whether it is worth while to spend money on purchasing the seed for introduction in a mixture.

Chicory is a plant which is strongly recommended by many farmers, and there is no doubt it is a thoroughly persistent, deep-rooted plant of which stock are very fond. It may be introduced into a mixture for pasture purposes, but is not so well adapted for hay, as its milky juice is difficult to dry.

Yarrow is a plant of common occurrence in many pastures, the seed of which can be purchased from most seedsmen. It has the advantage of being very drought resistant, and, possessing as it does underground stems, it rapidly fills up a pasture. Stock, especially sheep, are very fond of it, and in the case of light soil a small quantity may be introduced into a mixture for permanent purposes.

SEED MIXTURES.

Having reviewed very shortly the character of the more important plants we will now proceed to discuss the composition of seed mixtures. One might expect to get a good deal of information on this subject from the study of the composition of first-class permanent pastures throughout England, but in point of fact the information so obtained is very conflicting and comparatively valueless. Much has been done in the way of determining the botanical constituents of the herbage of good pastures throughout the country, notably by the late Dr. Fream and the late Dr. Carruthers, as also by Hall and Russell, Stapledon, Armstrong and others. In 1888 Dr. Fream got into touch with owners of many first-class pastures, who forwarded turves, which he planted in his garden at Downton, and from the plants which in due course appeared he was able to determine the relative abundance of the species met with. In 1888 and 1890 he investigated eighty turves obtained from different places in the United Kingdom. In the great majority of cases these turves were taken from "the best" grass fields in the particular district. The results obtained by Fream in 1888 attracted so much attention that in 1889 the Royal Agricultural Society of England instructed their Botanist, Dr. Carruthers, to investigate certain of the same grass fields from which Fream had obtained his turves. The fields investigated by Carruthers were fourteen in number and were those where in the previous year Fream had found that Perennial Ryegrass was present to the extent of at least 75 per cent. of the total grasses. The plan adopted by Carruthers was to enclose 16 square yards by hurdles close to the place from which Fream had in the previous year obtained his turves, and in the end of July, or early in August, these plots were mowed and the herbage weighed and analysed. The results were very surprising, remembering that the pastures to which they applied were "the best" in the country. Thus Fream found both in 1888 and 1890 that *Agrostis* was present in the great majority of cases, and that in several instances it occupied the first place in the list of species. This result was confirmed by Carruthers in 1889. Foxtail was much less frequently present, but on two occasions was the most abundant species. Sweet Scented Vernal and Yellow Oat Grass were present in about half the number of cases, and once in the case of Carruthers' investigation Yellow Oat Grass occupied the first place. Crested Dogtail was generally present, and on two occasions was the most abundant species found by Carruthers. Cocksfoot was also usually present and was found by Fream to be the most abundant species 3 times in 80; while Carruthers found it to be the first species once in 14 times. The fine-

leaved Fescues of the *ovina* type were usually present, and four times in the case of Fream's investigations were the most abundant species. Meadow Fescue was rarely present and must be regarded as quite a subordinate species in the case of first-class pastures. On the other hand, Yorkshire Fog was almost invariably met with, and in 1890 Fream found it occupied the first place 8 times in 80; while Carruthers in 1889 found it to be the most abundant species on one occasion. Timothy was not present in half the turves analysed by Fream, and a very similar result was got in Carruthers' investigations. Of the two meadow grasses (Smooth-stalked and Rough-stalked) the former was very rarely met with; while the latter was almost invariably present. Curiously enough Carruthers found that Squirrel-tail, *Hordeum pratense*, was the most important plant once in 14 times, and on another occasion was an equal first. But the most striking result that emerged from these investigations was concerned with Perennial Ryegrass which Fream found to be present in all his English turves, with one exception, in each year; while it was by far and away the most abundant species in both years of his investigation. In 1888 it occupied the first place 21 times in 25; while in 1890 it occupied the first place 29 times in 55. Carruthers confirmed this in 1889, meeting with the plant 13 times in 14; while in four cases it was either the most abundant species or shared the first place with another. There can therefore be no doubt about the value and permanent character of Perennial Ryegrass, although it is possible that the seed supplied by commercial firms is not so persistent as that furnished by the wild plant.

As regards Clovers, White Clover was almost invariably present, but Red Clover was not found on half either of Fream's turves or Carruthers' enclosures. As regards weeds, Buttercup was present in most cases, and Mouse-ear Chickweed was also a common constituent of these fine pastures. To summarise Fream's results it may be said that grasses might be present to the extent of only 11 per cent. or they might occupy the pasture to the complete exclusion of everything else, while Leguminosæ might be entirely absent or might contribute 38 per cent. of the herbage. As regards miscellaneous herbage, commonly called weeds, this might be entirely absent or might amount to 89 per cent. of the whole mixture. From these figures it is evident, therefore, that the botanical composition of a pasture does not determine its quality. Nor are we helped more by a chemical analysis, which Hall and Russell have shown to be quite valueless in determining the nutritive value of meadow herbage. The quality of a pasture appears to depend more on the character of the soil, the exposure of the field, the amount of moisture present, and the manurial treatment than on the

botanical composition of the herbage. To show how varying the relative abundance of plants may be, in even first-class feeding pastures, the following instances may be cited. Thus, in a fattening pasture at Sherborne in Dorset it was found that grasses constituted the whole of the herbage, and of these, Perennial Ryegrass amounted to 77 per cent. Fream found that a turf taken from one of the best pastures near Wiveliscombe in Somerset, contained a large quantity of Ryegrass and a fair amount of *Agrostis*, and this pasture on being investigated in 1889 by Dr. Carruthers was found to contain 52 per cent. of *Agrostis*, other 15 per cent. being made up of Yorkshire Fog. A fattening pasture at Sheen in Staffordshire was found to contain 67 per cent. of miscellaneous plants of which common Sorrel amounted to 86 per cent. On one of the best pastures near Taunton in Somerset, Fream found only 11 per cent of grasses, and no Leguminosæ at all, the bulk of the herbage, 89 per cent., in this case being made up of Yarrow. In a pasture described as "barely good enough to fatten oxen" at Elvaston in Derbyshire, Fream found, in 1888, that the grasses amounted to 18 per cent., and weeds to 89 per cent., and of the latter common Sorrel was by far the most abundant species. A first-class pasture at Quedgeley in Gloucestershire, contained 38 per cent. of White Clover, very few weeds, and 57 per cent. of grasses, which were almost entirely composed of Perennial Ryegrass and *Agrostis*. This result was subsequently confirmed by Carruthers.

One of the best pastures in County Mayo at Cloona Castle was found to contain 70 per cent. of weeds, consisting chiefly of Rib Grass and Hawkbit. A first-class sheep pasture at Bredwardine in Herefordshire was found both by Fream in 1888 and Carruthers in 1890 to be composed almost entirely of Ryegrass and White Clover. A famous Stilton cheese pasture at Beeby Manor, Leicestershire, showed 58 per cent. of grass and 42 per cent. of leguminous herbage, chiefly Wild White Clover. In this case the grasses were almost entirely Perennial Ryegrass and Cocksfoot. Foxtail was found to be the most abundant single species in a very good pasture in Thorney Fen in Cambridgeshire; while a good old pasture at Rothbury in Northumberland was found to contain as its most important species Yorkshire Fog. A pasture which was described as being "able to feed a bullock per acre well" in Warwickshire contained chiefly *Agrostis*, Perennial Ryegrass and Yorkshire Fog; while of the miscellaneous herbage Hawkbit was the most abundant species. Carruthers thus expressed himself in his Report in 1890, "The most obvious deduction is that the feeding value of a pasture depends more on the quality of the soil than on the nature of the herbage of which it is composed. None of the pastures inspected approach in feeding powers

those at Pawlett Hams, near the mouth of the Parrett in Somerset, and yet the grasses that form the great mass of the herbage there—Squirrel-tail, Ryegrass and Dogs-tail—are of second-rate value. On a medium soil they would produce a very poor pasture. One cannot fail to be impressed with the inferior quality of the grasses that make up the herbage in a great number of these famous pastures." The late Mr. Faunce de Laune, a strong opponent of Ryegrass, writing in this Journal in 1882, thus expressed himself, "The best coarse permanent pasture grasses which are valuable beyond all others are Cocksfoot, Meadow and Tall Fescue, Timothy and Foxtail; while the best fine grasses are Dogs-tail, Hard Fescue, Rough-stalked *Poa*, Fiorin, Sheep's Fescue and Golden Oat-grass." He recommended that Yarrow should always be included in a mixture, and as regards Ryegrass he says that it is one of the most pernicious plants in newly-formed pastures, and which, in fact, may be classed with Yorkshire Fog. The attitude adopted towards Perennial Ryegrass both by Faunce de Laune and Caruthers seems to be thoroughly unjustified.

In the history of a field recently laid down to permanent grass, Sir J. B. Lawes in the *Journal of the Royal Agricultural Society* in 1889 gave the following particulars: *Poa trivialis* was twice out of twelve annual determinations the most prominent grass; while *Poa pratensis* was never first and only once second, and that was in the first determination. Perennial Ryegrass retained a place more or less steadily amongst the first five grasses. Cocksfoot was the most prominent grass in the first determination, but it was never again amongst the first five. It must be remembered, however, that Rothamsted does not suit this particular species.

The lessons to be learned from a study of the fine old pastures of England are: (1) that it seems quite unnecessary to introduce into a mixture of seed any species which is not usually present in an old pasture, *e.g.* Meadow Fescue and Smooth-stalked Meadow Grass; (2) that the good plants which are generally present and frequently abundant are those which are of special importance in a mixture, and should be usually introduced, *e.g.* Perennial Ryegrass, Cocksfoot, Rough-stalked Meadow Grass and Wild White Clover. While many plants are no index at all of the quality of a pasture, there is one whose presence is always associated with good pasture, namely, Wild White Clover. It is to be doubted whether there is any case on record of a pasture being bad which contains this plant in abundance.

In selecting seeds one should see that the quality is good, and by quality one understands chiefly the purity and generative capacity. As regards purity it may be, however, that

impurities may mean nothing worse than dust and husks, or, on the other hand, it may mean the presence of seed other than that which is purchased. In the latter case, again, the additional seeds may be the seeds of indifferent plants, or they may be the seeds of weeds, in which case the presence of impurities may become much more serious. For instance, the seed of Wild White Clover often contains a certain amount of the seed of small yellow clovers like Suckling Clover, and although one does not desire this plant when one is paying a high price for Wild White Clover, still the presence of Suckling Clover is not very serious, provided it is allowed for in the price. Then, again, one has to remember that land naturally contains a great abundance of weed seeds, so that the addition of a small quantity of this class of plant as an impurity in a seed mixture cannot be regarded as very serious. This remark, of course, does not apply to such an impurity as Dodder, which in the South and Midlands of England may do much damage to clover fields.

As regards the germinative capacity, this is a matter of much importance, because seed that is incapable of germinating is of no value at all. Again, however, it is largely a question of price, except that there is this to be said, namely, that seed of a low germinative capacity contains a certain amount of grains that will germinate in a laboratory test but which are too feeble to produce plants satisfactorily in the rough and tumble of a field.

By multiplying the percentage germination by the per cent. of purity and dividing by 100, we get what is called the Real Value of the seed, namely, the weight of pure seed capable of germinating in 100 lb. of the bulk. Thus, for example, if a sample of seed germinates 90 per cent. and has a purity of 90 per cent., that means that 81 lb. in every 100 contains the seed we want, and that it is capable of germinating. It is on the basis of Real Value that the true cost of a sample of seed is determined. Suppose, for instance, that seed is offered at 2s. 6d. per pound whose germination is guaranteed at 90 per cent. and also the purity at 90 per cent. This means that each pound of pure germinative seed is costing 3s. 1d. Suppose another sample is offered at 2s. a pound whose germinative capacity is 80 per cent. with a purity of 75 per cent., this means a Real Value of 60, so that each pound of pure and germinating seed in this case costs 3s. 4d. This shows that a mere statement of price per pound is of very little use unless accompanied by a statement of germination and purity.

Another character bound up in the term quality is strain. For instance, there are certain varieties or strains of Red Clover that are much more persistent than others, and as these cannot

be distinguished by inspection one must rely on the character of the seedsman. Similarly in the case of Wild White Clover, whose seed is practically indistinguishable from Dutch White.

In the following suggestions as to mixtures, the prices have been taken for the most part from the current price list of a well-known though not a "fashionable" seedsman.

Where seed is being sowed for a one year's ley no plant should be included which does not give its full return in the first year, the selection being therefore chiefly amongst the annuals and biennials. Where land will carry clover, there is no better seed for a one year's ley than Broad Red Clover at the rate of about 14 lb. and a cost of about 13s. per acre. Where, however, clover sickness is to be feared, a mixture of equal parts of Broad Red Clover and Cow-grass, or Late Flowering Red, might be used, the cost being increased to about 16s. an acre. Another mixture that might be tried in the case of clover-sick land is 7 lb. of Cow-grass, 3 lb. of Alsylke, and 6 lb. of Trefoil, the cost in this case being about 15s. an acre. In many parts of the country pure Italian Ryegrass is sowed at the rate of $1\frac{1}{2}$ bushels, or, say 36 lb. per acre, the cost in this case being about 18s. In some parts of the country Giant Sainfoin is depended on for a one year's ley, 56 lb. being used, the cost being about as many shillings per acre.

In the North, Perennial Ryegrass is largely substituted for Italian, a common mixture being 18 lb. Perennial Ryegrass, 4 lb. Broad Red Clover, 2 lb. White Dutch Clover, 2 lb. Alsylke Clover, the cost being about 18s. per acre.

If it is intended to leave down the ley for two years, then Perennial Ryegrass may, in whole or in part, be substituted for Italian Ryegrass, and a small quantity of Cocksfoot and White Dutch Clover may be introduced and Broad Red Clover be used in reduced quantity.

For a three or four years' ley the following mixture is largely adopted in the North country :—

	Approximate cost per acre
	£ s. d.
12 lb. Perennial Ryegrass	0 7 0
6 lb. Cocksfoot	0 4 6
3 lb. Timothy	0 1 9
1 lb. Broad Red Clover	0 1 0
1 lb. Cowgrass	0 1 6
1 lb. Alsylke	0 0 9
2 lb. Dutch White	0 4 0
4 lb. Trefoil	0 2 0
$\frac{1}{2}$ lb. Wild White Clover	0 6 0
Total $30\frac{1}{2}$	£1 7 6

Authorities are somewhat divided in opinion as to what should be included and what excluded from a permanent mixture. Some say that practically all permanent grasses and other plants should be added, even if only in small quantities, so that if the conditions are suitable the plants are there to establish themselves. Others again argue that the proper course is to depend on a few only of the most useful species and to hope for the accidental appearance of other plants through the agency of wind-borne seed or otherwise, and no doubt instances could be quoted of the success of both systems.

The main types of soil to be sowed to permanent pasture may be classified as,

- (a) Clay or heavy loam,
- (b) Light, sandy or gravelly soil, and
- (c) Thin soil on the chalk or on the Oolitic formation.

For use on heavy soil the following mixture may be recommended:—

	Approximate cost per acre £ s. d.
12 lb. Perennial Ryegrass	0 7 0
8 lb. Cocksfoot	0 6 0
6 lb. Timothy	0 3 6
1 lb. Crested Dogstail	0 1 0
1 lb. Rough-stalked Meadow Grass	0 1 9
3 lb. Late Flowering Red Clover	0 4 0
1 lb. Wild White Clover	0 10 0
<u>32</u>	<u>£1 13 3</u>

In the case of a light, dry soil, Ryegrass and Cocksfoot might remain as before, but Timothy should be omitted altogether or reduced in quantity. Such a mixture might consist of the following:—

	Approximate cost per acre £ s. d.
12 lb. Perennial Ryegrass	0 7 0
8 lb. Cocksfoot	0 6 0
1 lb. Crested Dogstail	0 1 0
1 lb. Hard Fescue	0 2 0
3 lb. Late Flowering Red Clover	0 4 0
2 lb. Trefoil	0 1 0
1 lb. Wild White Clover	0 10 0
<u>28</u>	<u>£1 11 0</u>

In addition to these, Tall Oat-grass and Golden Oat-grass may be included to the extent of 1 lb. each, and Yarrow might also be used at the rate of about $\frac{1}{2}$ lb. per acre, the additional cost being about 10s. per acre.

For use on chalk or thin limestone soil a mixture that may be expected to give good results consists of the following :—

		Approximate cost per acre		
		£	s.	d.
12	lb. Perennial Rye-grass	0	7	0
8	lb. Cocksfoot	0	6	0
1	lb. Crested Dogstail	0	1	0
1	lb. Golden Oat-grass	0	4	0
1	lb. Hard Fescue	0	2	0
2	lb. Late Flowering Red Clover	0	3	0
1	lb. Wild White Clover	0	10	0
2	lb. Trefoil	0	1	0
1	lb. Kidney Vetch	0	1	6
2	lb. Burnet	0	2	0
$\frac{1}{2}$	lb. Yarrow	0	3	6
<u>31$\frac{1}{2}$</u>		<u>£2</u>	<u>1</u>	<u>0</u>

The above quantities are very ample, and may be considerably reduced in the case of good land in fine condition.

As regards the time of year when the seed should be sowed, one has a choice between putting it in in spring or in autumn. If sowed in spring the young plants have got to encounter the summer's drought, which may appear before they are properly rooted and kill off large numbers. As regards autumn sowing, this is usually possible only after a bare summer fallow, for it is usually only by means of such a preparation that the land can be got into proper mechanical condition. If the seed is sowed by the end of August there is time for the plants to establish themselves before winter, and very good results are often obtained.

Another question that has to be settled is whether the seed, if sowed in spring, is to be put in with a covering corn crop or not. On the whole it is probably best to put in the seed with a light sowing of barley or of oats, say, about 2 bushels of the former and 2 $\frac{1}{2}$ bushels of the latter per acre. The covering crop does something to protect the young plants against the sun, and weeds are also kept under to some extent; while even at the present low prices for grain a very considerable return is got from the corn crop. Moreover, the stubble gives some protection to the young plants during the first winter. In some parts of the country, notably the north and west, land is often laid away to grass with a seeding of rape, say, about 5 or 6 lb. per acre. About the month of August sheep are turned on to the land to eat the rape and the young clover and grass plants which are then well established.

Remembering that the seeds of grasses and clovers are very small, a fine tilth is highly desirable for the seed bed. In the case of sowing in spring the land should be ploughed in autumn

so as to become thoroughly mellowed by the winter's frost. Then, in the month of March, the field is well harrowed, and if corn is sowed it is then put in. The land ought then to be rolled with a rib or Cambridge roller, and the seed be sowed broadcast over the rolled surface. Then a single-stroke of the grass seed harrows or light chain harrows will provide sufficient covering, after which another rolling is necessary, either by means of a plain roller or a Cambridge roller. If the sowing is done by machine the seed may be all mixed together, but if it is done by hand, then the heavy seeds should be sowed separately from the light seeds. It involves a little more labour, but it is a good plan to divide the seed into two portions and to sow these at right angles to each other. In this way one may be reasonably certain that the whole of the surface is provided with seed. Assuming that a crop of corn is being taken, there is nothing more to do to the field until the grain is harvested, when the area should be very carefully gone over and any blanks should be supplied with supplementary seed. This, if not done in autumn, should be attended to in the following spring. In the spring also the land should be heavily rolled so as to secure any plants that may be heaved up by frost. In the autumn a dressing of phosphates should be applied, which may take the form of basic slag (8-10 cwt.) or of ground mineral phosphate (5 cwt. per acre).

It is well to avoid grazing the land during the first winter, but subsequently it may be either grazed or hayed, as is deemed most convenient. If grazed, young horned stock are more suitable than mature animals. Then for two or three years attention must be given to weeds, which ought to be cut over or spudded out. The droppings of cattle should be spread, and the field be chain-harrowed at least once a year. The phosphatic dressing should be repeated in reduced quantity every three or four years.

Opinion is divided as to whether a field should be constantly grazed, or whether an occasional hay crop may be taken. Broadly speaking, it is probably best to reserve certain fields exclusively for pasture and others for hay, but if a pasture is showing an undesirable quantity of thistles or other strong weeds, occasional mowing presents a means of cheaply reducing their numbers.

Those who desire to go further into this subject will find useful information in the following Papers:—

- W. FREAM, "The Herbage of Old Grass Lands," *Jour. Roy. Agric. Soc. Engl.*, vol. xxiv., 2nd Series, p. 415; and "The Herbage of Pastures," *Jour. Roy. Agric. Soc. Engl.*, vol. i., 3rd Series, p. 359.

- W. CARRUTHERS, "The Composition of Some of the Famous Ancient Pastures of England," *Jour. Roy. Agric. Soc. Engl.* vol. i., 3rd Series, p. 751.
- A. D. HALL and E. J. RUSSELL, "On the Causes of the High Nutritive Value and Fertility of the Fattening Pastures of Romney Marsh and other Marshes in the S.E. of England," *Jour. Agric. Science*, vol. iv., p. 339.
- S. F. ARMSTRONG, "The Botanical and Chemical Composition of the Herbage of Pastures and Meadows," *Jour. Agric. Science*, vol. ii., p. 283.
- J. B. LAWES, "The History of a Field newly laid down to Permanent Grass," *Jour. Roy. Agric. Soc. Engl.*, 1889, p. 1.
- R. G. STAPLEDON and T. J. JENKIN, "Pasture Problems," *Jour. Agric. Science*, vol. viii., p. 53.
- T. H. MIDDLETON, "The Formation of Permanent Pastures," *Jour. Board of Agric.*, vol. xii., pp. 385 and 449.
- D. A. GILCHRIST, "Trials of Wild White Clover," *Jour. Board of Agric.*, vol. xxii.
- J. THOMAS WAY, "On the relative Nutritive and Fattening Properties of different Natural and Artificial Grasses," *Jour. Roy. Agric. Soc. Engl.*, vol. xiv., p. 171.
- M. J. SUTTON, "Permanent and Temporary Pastures."
- A. D. HALL, "The Manuring of Grass Land," *Jour. Roy. Agric. Soc. Engl.*, 1903, p. 76.
- CARRUTHERS and VOELCKER, 2nd Report on the Grass Experiments conducted by the Society, *Jour. Roy. Agric. Soc.*, 1900, p. 116.
- SOMERVILLE, "Poverty Bottom," an Experiment in increased Food Production, Miscellaneous Publications of the Min. of Agriculture, 1918.
- SOMERVILLE, Manuring of Pastures for Meat and Milk, Min. of Agric., Miscellaneous Papers, No. 20, 1921.
- WOOD and BERRY, "Soil Analysis as a Guide to the Manurial Treatment of Poor Pastures," *Jour. Agric. Science*, vol. i., p. 114.
- J. CAIRD, "Recent Experiences in laying down Land to Grass," *Jour. Roy. Agric. Soc. Engl.*, 1888, p. 124.

W. SOMERVILLE.

School of Rural Economy,
Oxford.

STOCK-FARMING ON ARABLE LAND.

THE nation's need of an increased output of home-grown food during the war demanded that the question of grass land in relation to production should receive very careful consideration.

Previous to the war, this country was not producing all that it was capable of, regarded from the point of view of quantity without reference to profit, and undoubtedly the first step towards increasing food production was to make the very most of every acre under the plough, whilst the next was to increase the area under cultivation. At the time, much was written in the Press against an extensive policy of breaking up grass land, and one of the chief arguments put forward was that with a decreased acreage under grass there was the likelihood that the stocks of cattle and sheep would be greatly depleted. The exponents of the plough policy, on the other hand, argued that there was no need to fear this, for an arable rotation could be made to provide both winter and summer keep for stock, and that, by judicious cropping, the fodder from a rotation might be considerably increased. It was further argued that much of the grass land in this country was of such an inferior nature that, if brought under the plough, the loss to the stock-owner would be almost negligible. It was pointed out that a large head of stock could be kept, even with a limited area of pasture, by forage crops grown on arable land, cut and fed to the stock either indoors or spread out on the pasture. It was shown, too, that an acre of land growing forage crops would produce a much larger bulk of fodder than an acre of grass.

The plough policy was adopted and many acres of grass came under the plough. Since that time many of these acres have either been laid down or have been allowed to fall down to grass, and the acreage under cultivation as disclosed by the *Agricultural Statistics* for 1923 is much the same as it was in 1914.

During the war, agriculture was much to the fore, and no effort was spared to obtain the highest yield possible from the land. The national emergency demanded it, and prices justified it. To-day, agriculture is again in the public eye, not so much from the point of view of increasing production, but rather from that of endeavouring to prevent reduction both in output from the land and in employment.

There is at the present time a tendency further to reduce the acreage under cultivation, with the consequent diminution in the amount of labour employed on the land. Various remedies have been put forward, and it has been suggested that if an arable-land farmer cannot make a living out of corn-growing, he may be able to do so by keeping stock on arable land. By

this means, it is maintained, land will still remain under the plough, labour will be retained in agriculture, and it would be a simple task to change from stock-farming to corn-growing should corn prices improve or a national necessity arise.

Though it has long been the practice to keep sheep on the produce of arable land, throughout both summer and winter, it is only within the last ten years that the question whether other stock can be profitably kept on plough-land crops throughout the year has been seriously considered in this country. There is, however, an exception, for there is one class of arable stock-farming, not always recognised as such, that has long been practised in certain districts, namely, the use of long leys or temporary pastures.

DAIRYING.

Greensoiling in the summer has long been carried out on the Continent and in America, but for some reason or other it has, till recently, found but little favour in this country. The possibilities of this type of farming was brought before the agricultural community by the Harper-Adams Agricultural College. Experiments carried out at this college demonstrated what could be done in this direction under conditions appertaining to this country. These experiments have shown that milk-cows can successfully be kept entirely on the produce of arable land without any pasture grazing, and that no trouble was experienced either from cattle in bad health or any difficulty in breeding.

On farms where this system is carried out the cropping of the land to provide fodder throughout the year is, in the main, the same. The mainstay for early food in the spring is a mixture of autumn-sown cereals and vetches. When sown in September, or early October, these mixtures will come in for use the following May and June. These are followed by spring-sown cereals and vetches, with or without peas. One of the troubles met with, with all such mixtures, is that the crop is apt to mature quickly, and the period of use is soon over. A mixture which in some districts has proved most useful during the latter part of July, August, and early September, consists of rape, buckwheat, and peas, 4 lb. of rape and 1 bushel each of buckwheat and peas.

Lucerne, where it can be grown successfully, is most valuable, especially in dry districts. Maize in the Eastern and Southern Counties can be relied on for autumn use, whilst marrow-stem kale will provide valuable fodder from August to December. Thousand-headed kale, cabbages, mangolds, and silage are the staple foods for winter. For hay, oats and peas have been recommended; this mixture provides an excellent and nutritious

fodder, but in a wet season the difficulty of "making" it is great.

One of the results of adopting this intensive system of dairy farming is the beneficial effect on the fertility of the soil. Not only is this due to the increased amount of plant food, partly from the leguminous crops grown and partly from the greater amount of manure produced, but also to the improved physical condition of the soil. The latter condition is bound to result from the large amount of humus or vegetable matter that is returned to the land. That the output per acre is greater under such a method than from grass cannot be disputed. In some cases up to 500 gallons of milk per acre have been obtained during the year, whilst from grass a farmer is satisfied with a yield of from 200 to 300 gallons per acre. From such figures as these, it might be assumed that the advantages of a system of intensive arable stock-farming are so obvious as to bring about their speedy adoption. There are, however, disadvantages, apart from the economic side of the question, that may make the average farmer hesitate before adopting the system in its entirety.

In this country, with its varied geological and climatic conditions, a system of farming that proves successful in a certain locality may very often prove to be a complete failure in other districts. To carry out successfully the intensive growing and feeding of soiling crops, where no pasture is available, the farmer is more or less compelled to work to a strict time-table. In many districts and on many soils this is very nearly impossible in each and every year. In adverse seasons great difficulty may be experienced in securing a crop owing to the land being either too dry and hard, or too wet. We are told that when these conditions arise, and when a crop has failed, the farmer must fall back on the use of such winter foods as hay and mangolds that he may have kept in hand, or that he must rely on silage. It would appear that the silo or silage clamp is a necessary adjunct on a farm where this system is carried out. Not only will it provide food when, through some cause or other, there is a *hiatus* in the supply of green fodder, but also it will minimise waste. It may happen in a good growing season that a fodder crop produces a greater bulk than was estimated, and in excess of immediate requirements. By means of the silo or the clamp the fodder not required can be stored for future consumption.

Again, a farmer may be deterred by the complicated nature of the cropping that is necessary and by the large amount of labour that is required. On a farm of 35 acres, of which 10 acres are inferior grass, and the remainder arable, where 23 cows, a few calves, and two horses are kept, the labour

required is a man and his wife, a horseman, and a labourer for a quarter of the year. On this farm the crops grown are entirely those to be used for feeding the cows.

Very valuable as these experiments are, they have not yet proved, from a profit-making point of view, that it is desirable for the farmer wholly to adopt this system. The increase of production and of employment, and the maintenance of the arable area, are undeniable, but the economics of the system have never been worked out fully.

There are again advocates of a modified form of this method of greensoiling. It is suggested that to minimise the risk of crop failures a certain area should remain under grass, and it is further argued that milk can be produced from grass in the early part of summer at a cheaper rate than from forage crops grown on arable land. In addition, it is maintained that cows, and certainly young stock, will thrive better when out at grass than when kept entirely inside. In some districts this modified form is practised, and it is employed on many dairy farms. On these farms it is common to find that soiling crops are grown for use in early autumn, when pastures begin to fail, and in those months when there is likely to be a shortage of grass through drought. As an example, a large dairy farm in South Essex may be taken.

On this farm 200 dairy cows are kept. During the summer they are out at grass and the area allowed per cow is half an acre. During May and June they receive green fodder in addition at the rate of 30 lb. per cow. Throughout July and August they receive mangolds. It is interesting to note, in passing, that the mangolds keep excellently till this date provided that the clamp is not earthed up but covered instead with two feet of straw. After August, when the mangolds are done, the pasture is supplemented with cabbages, and in October the cows go on to winter diet. In this case the fodder mixture referred to as being fed in May and June consists of 4 bushels per acre of oats, wheat, beans, peas, and vetches. The area under the crop was 12 acres for the 200 head. In winter the cows receive 6 lb. of hay a day, 7 lb. of chaff, and in addition 70 lb. of roots, and concentrated food according to milk yield. Taking the yield of mangolds at 40 tons, cabbages and other roots at 20 tons, and seeds hay at 50 cwt. to the acre, and ignoring in the estimate the straw consumed and used for litter, the total arable land used for growing cow fodder is just over half an acre to each cow. Thus, with the grass, an acre of land provides food for one cow. In this case, however, a certain amount of concentrated food is fed during the summer, being again regulated according to yield.

It has been suggested by some writers that the grass neces-

nary for working a farm under this modified form of green-soiling might be provided by utilising long leys or temporary pastures. That long leys play an important part in the farming in some districts of this country is well known. On the dairy farms in South Lancashire, where there is very little, if any, permanent pasture, temporary pastures are the mainstay for the summer keep of the cows. A typical dairy farm near Warrington is taken as an example. The farm is of 98 acres, the whole of which is under the plough. A herd of 33 cows, of the large type of Cumberland Shorthorn, is kept. A milk yield of 60 gallons per day is maintained throughout the year. It is the custom to raise few, if any, of the calves.

The rotation followed on this farm is a seven-course :

Roots.
Wheat.
Oats.
Seeds mown and aftermath grazed.
Seeds grazed.
Seeds grazed.
Oats.

The root break consists partly of potatoes and partly of cattle feed. A few acres of early potatoes are grown, and as soon as these are off marrow-stem Kale is transplanted on to the land. The seeds mixture consists of Broad Red Clover, alsike, Dutch white, cow-grass, and Perennial rye-grass. The cows spend the summer on the grazing seeds till such time as the aftermath is ready. This is supplemented in the autumn with the marrow stem kale. Thus, on this farm the 33 cows are kept on the produce of 48 acres, the straw not being taken into consideration. The amount of milk produced per acre in the year is 436 gallons.

As an example of a dairy and stock-raising farm, a farm of 52 acres in Delamere Forest may be taken. On this light-land farm, which is entirely under the plough, the rotation followed is a six-course :

Roots.
Oats or Barley.
Seeds mown and the aftermath grazed.
Seeds grazed.
Seeds grazed.
Oats.

Here, again, the root break consists of potatoes, mangolds, swedes, and turnips. The swedes are not all consumed on the farm, as in this case the farm is favourably situated, near

a station, and there is a ready sale for roots to the cowkeepers of Liverpool. For the seeds ley the mixture used is:

- 3 lb. Broad Red Clover.
- 3 lb. Cow-grass.
- 3 lb. Alsike.
- 3 lb. Timothy.
- 1 lb. Cocksfoot.
- $\frac{1}{4}$ lb. Wild White Clover.
- $\frac{1}{4}$ lb. Chicory.

The stock on the farm is 2 horses, 14 cows, 5 heifers, 5 calves, and 3 sows with their litters. The practice is for all the cows to calve down in early spring in order to provide milk throughout the summer and autumn for the manufacture of cheese, of which 40 lb. are made per day. Without taking into account the straw, all the stock are supported by the produce of 30 acres, and from this, on the assumption that a gallon of milk produces a pound of cheese, the approximate amount of milk produced is 7,800 gallons, or 260 gallons per acre. The cows receive 1 lb. of cake per head per day during the summer, and no concentrated food during the winter, when they are for the most part dry. The farm is run by the farmer and his wife, a son and a daughter.

In none of these cases are figures of costs and profits available, but the farms are all of them going concerns, and their tenants are satisfied with the results. The head of stock carried and the production are evidence of the intensity of the farming.

BEEF.

Each year very large numbers of fat cattle are produced from the East of Scotland. A number of these are fattened in yards, but a large number also are fed and finished on temporary grass. It is customary to point to Scotland as having maintained its arable area during a period in which tillage has undergone a heavy decline in England. The increase in permanent pasture in England has its counterpart in Scotland in long leys, which are returned for statistical purposes as "arable," because they still come under the plough at intervals. Fife, Forfar, Perth, and Aberdeen all send out a great amount of summer-fed beef, produced in most cases off long leys. In most of these counties the temporary pastures remain down three or four years. In some cases they are mown the first and grazed the subsequent years, and in other cases they are grazed the first and second and mown in the last. On these

farms many different seed mixtures are used, and the following are given as examples:

- (1) 12 lb. Perennial Rye-grass.
- 6 lb. Cocksfoot.
- 3 lb. Timothy.
- 3 lb. Cow-grass.
- 3 lb. Dutch White.
- 3 lb. Alsike.
- 1 lb. Kidney Vetch.

On the farm (Forfar) where this mixture was grown, the seeds are grazed for the first two years and mown in the third. Bullocks are put on to them at the rate of one to the acre in May, and go off fat about the second week in August. 4 lb. of cake are fed to them in addition.

- (2) 22 lb. Rye-grass.
- 6 lb. Cocksfoot.
- 1 lb. Fescue.
- 1 lb. Timothy.
- 2 lb. Cow-grass.
- 2 lb. Alsike.
- 2 lb. Broad Red.
- 1½ lb. Dutch White.
- ½ lb. Wild White.

This mixture is usually left down for four years. On it bullocks are fed at the rate of two to the acre, but a large amount of cake is fed, even as much as 10 lb. per head. This mixture is taken from a farm in Fife.

- (3) 10 lb. Rye-grass.
- 10 lb. Cocksfoot.
- 6 lb. Timothy.
- 4 lb. Red Clover.
- 1 lb. Rough-stalked Meadow-grass.
- ½ lb. Alsike.
- ½ lb. Dutch White.
- 1 lb. Wild White.

This mixture is used on a heavy clay farm in Aberdeenshire. Bullocks are turned on in May at the rate of one to the acre, and go out fat in September, without cake, having put on an average daily gain of 2 lb. live weight. On this farm basic slag and other mineral phosphates are used in large quantities. Production from these long leys is undoubtedly greater than that from a permanent pasture of average quality.

In answer to the question why long leys are not more often

used in the South and East of England when they are so successful in the North and West, the reason given is that the rainfall is not high enough. Again, other objections advanced are the difficulty of getting the turf sufficiently weathered and broken down in the normal southern winter, and the prevalence of wireworm after the grass is ploughed up. It is highly probable that the greater rainfall in the North and West may help to produce good sound temporary pastures, but that they have been grown in the South has been definitely shown. An instance may be given where three years' leys have been successfully grown on a heavy clay farm in Essex. In this case the mixture used was :

- 10 lb. Lucerne.
- 2 lb. Single-cut Clover.
- 2 lb. White Clover.
- 1½ lb. Alsike.
- 4 lb. Italian Rye-grass.
- 8 lb. Perennial Rye-grass.
- 3 lb. Cocksfoot.
- 2 lb. Meadow Fescue.

The ley was grazed the first year, mown the second, and grazed the third. During the summer of 1923, the third year of the ley, one field of 25 acres carried, from May till the end of August, 24 two-year-old bullocks and 6 eighteen-month-old bullocks. In addition they received 6 lb. of oats, bran, and cotton cake. At the end of the period they were fat, and the estimated increase per head was just under 2 cwt. On the same farm another field of 30 acres carried throughout the summer 32 in-calf heifers, 3 cows and their calves, and a bull. This lot received no cake. These leys, even after the drought in the early part of the summer, compared very favourably with those to be seen in the North. They showed an abundance of bottom growth.

This one instance does not go to prove that long leys can be adopted without fear of failure in the South and East of England, but it does indicate that further trials are worth while, to explore the possibilities in this direction. If the technical problems can be solved, the increase of production which would result is obvious.

PORK.

A branch of arable stock-farming that has in recent years received a considerable amount of attention at the hands of certain farmers and writers is the keeping of pigs on forage

rops. That this is still a controversial matter is to be seen from the numerous articles and letters that appear in the *Agricultural Press*. On the one side we have large pig-breeders maintaining that this is the most economical method of pig-farming, whilst on the other side equally well-known men condemn it as being too costly and uneconomic. It has certainly been demonstrated that pigs can be grown successfully on a series of arable-land crops, and it is possible for a farmer to work out a succession of crops that will suit the conditions of his particular farm. From an economic point of view, there is not yet sufficient data to state definitely whether or not the policy of keeping pigs on arable land is sound.

Experiments have been carried out on the fattening of pigs on grass as against fattening them indoors.¹ At the College Farm, Kilmarnock, the rate of increase with the indoor pigs was markedly greater than that with the outdoor, but as Principal Paterson points out, the difference might possibly be due to the very unfavourable season, and that the young pigs were not out of doors when suckling.

Discussing the results of an experiment at the University College of North Wales, Bangor, Professor White and Mr. E. J. Roberts state²:

"(1) The indoor lot of pigs did not suffer from any lack of 'vitamines,' and as their ration was probably less varied than ordinary farm feeding, there must be much less danger of pigs suffering in this way than is often suggested. . . .

"(2) The extra energy used by the outdoor pigs in ranging about, dissipated all the extra food material obtained in their green ration and counterbalanced any special value which exercise and green food may have had. Possibly part of this was used in providing the greater amount of heat required to maintain body temperature, but as the experiment was confined to the summer months, the difference between the outdoor and the indoor pigs could not be particularly great in this respect. Had the experiment been continued through the winter, it is only reasonable to suppose that this last factor would have played a more important part."

These fattening experiments were carried out with pigs on grass, and whether the same conditions will apply to pigs fattened on arable-land crops has yet to be shown. If we turn to Denmark, whose example we are so often told to follow, we find that all the pig-fattening is carried out indoors, and seldom are pigs of any description to be seen in the fields. In America, on the other hand, pigs, both breeding and feeding,

¹ *Transactions of the Highland and Agricultural Society of Scotland*, 1923.

² *Journal of the Ministry of Agriculture*, April, 1923.

are largely kept on forage crops on arable land. That it is possible to fatten pigs on arable land crops is no doubt true, but whether it is an economical practice has yet to be proved.

CONCLUSION.

The position, then, is that though we know that a greater output per acre can be made from arable stock-farming than from grass, there is insufficient evidence that the increased output, with its greater cost in labour, raw materials, and equipment, will be profitable. Useful as these various experiments are in demonstrating the technical side of the system, they have not proved that it is a sound economic proposition. Nothing in the nature of accurate cost accounts have been produced, and the only estimates that can be made are based on conventional figures.

Arable sheep-farming is a well-established farming system with which most people are familiar, and it may be safely left out of account in the consideration of arable stock-farming but our knowledge of the other branches is very limited. A fuller investigation of the economics must be made before it can, with confidence, be put forward as an alternative to land going down to grass in times of low prices for cereal products. It has many branches and modifications that all require thorough investigation.

This is not the time when the industry itself can be expected to take the initiative in testing-out new systems of a somewhat revolutionary character. On the other hand, the advantages of arable stock-farming from the point of view of production and employment have been demonstrated already, and the prospect of financial advantage is sufficiently hopeful to justify a national experiment. It is only by such an investigation, extending over a number of years and carried on in different districts, that a true comparison could be made between grass and arable stock-farming, and it might well engage the attention of those who administer the research funds available for agriculture. The need for scientific research has long been recognised, but the possibility of the profitable employment of public funds in the investigation of the economics of modification of established farming practice has not yet been realised. In these days, when the agricultural industry is steadily dwindling, the matter is worthy of serious consideration.

W. R. PEEL.

School of Rural Economy,
Oxford.

CROPS FOR ENSILAGE.

IN view of the great interest taken in Ensilage at the present time by British and Irish farmers it is a matter of considerable importance that as much information as possible should be obtained as to the most suitable crops to grow for silage purposes. In the Eastern and Midland districts of England, and probably also in many parts of the South and South-West, it is the general experience that autumn-sown crops grow a bigger weight of material than spring-sown crops. Thus, in these districts autumn-sown tares are usually much better than spring-sown tares, autumn-sown beans better than spring-sown beans, and autumn-sown oats often better than spring-sown oats. For this reason nearly all silage-making farmers in East Anglia, of whom there are a considerable number, grow various mixtures of autumn-sown crops for their silos. It follows by no means, however, in other parts of the country, where the rainfall is heavier, that autumn-sown crops are necessarily the best. In fact, in northern and western districts and in Scotland and Ireland it may very often happen that spring-sown crops will prove more satisfactory.

In view of the popularity of various mixtures of oats and tares it was decided to try several of these in Suffolk, and to introduce a few beans into some of the plots, to see whether it is possible to get a mixture which will stand up well on good land, in an average season.

In the autumn of 1920 plots were laid out at three centres, on fairly heavy land, the following mixtures being sown in plots of about an acre each.

Mixture sown per acre.	General observations made, with weight per acre, at one centre at the end of June, 1921.
(1) 2 bush. ordinary winter oats	Stood up well.
1 " tares	A considerable proportion of oats, 15 tons.
(2) 2 bush. tares	Chiefly tares. Very little rye present at any centre. 15 tons.
1 " rye	
(3) 2 bush. tares	A good proportion of tares, but the mixture stood up fairly well. 15 tons.
1 " "Marvellous" winter oats	
(4) 2 bush. tares	A good proportion of tares, but the mixture did not stand up so well as No. 3. 14½ tons.
1 " ordinary winter oats.	
(5) 2 bush. tares	A good proportion of tares. The "Bountiful" oats did not succeed so well as the ordinary winter oats. 14½ tons.
1 " "Bountiful" winter oats	
(6) 2 bush. tares	The beans held the crop up fairly well.
1 " winter beans.	
(7) 2 bush. tares	The wheat was smothered by the tares.
1 " wheat	
(8) 1 bush. tares	Stood up fairly well. A very promising mixture.
1 " ordinary winter oats	
1 " beans	

It will be remembered that the summer of 1921 was very dry—in spite of this, however, only a few of the plots stood up well. A capacity to stand up well off the ground is a very important quality in a silage mixture. Badly laid crops result in a considerable length of stem (of the vetches especially) becoming rotten, and this means a great deal of waste. The rotten portion is usually left uncut upon the ground, but if cut, it is mixed with the other green stuff and reduces the quality of the silage. When the crop is badly laid it is a difficult matter to cut it, and extra manual labour may have to be employed in pulling away the cut portion from the uncut, so that the driver of the mowing machine may see where to go.

The land at all the centres was fairly heavy and this probably accounts for the failure of the rye. On lighter land, experience elsewhere indicates that a little rye is a valuable addition to the mixture.

In the autumn of 1921 a trial with various mixtures was again arranged and the results, as weighed in June, 1922, are given below, the soil being a heavy loam.

Mixture of seed (Quantities per acre)	Cost of seed per acre. Autumn, 1921	Weight of crop per acre
	<i>s. d.</i>	tons. cwt.
1. 1 bushel of tares, 1 bushel oats, 1 bushel beans	25 6	15 16
2. As No. 1, only the beans were broadcasted before ploughing the land	25 6	15 14
3. 1½ bushels oats, 1½ bushels tares	25 0	14 0
4. 1½ bushels beans broadcasted and ploughed in, 1½ bushels of tares drilled	31 0	13 7
5. 1½ bushels tares, 1½ bushels "Marvellous" oats	25 0 (at ordinary price for oats)	13 15
6. 1 bushel beans (broadcast and ploughed in some time before drilling), 1 bushel tares, 1 bushel oats	25 6	12 4

The oats were ordinary winter oats, except on plot No. 5.

The small differences in weight obtained may not be very significant, as owing to the tangled character of the crop it was very difficult to weigh accurately. The crop, however, was very carefully inspected on the various plots, and as the results of the two years' trials, the opinion was formed that a very useful mixture would be 1 bushel of tares, ½ to 1 bushel of beans, and 1 bushel of winter oats.

"Marvellous" winter oats are very strong in the straw, and are well worth a trial, in place of ordinary winter oats, in

silage mixtures. Experience elsewhere indicates, however, that they are somewhat deficient in tillering power compared with ordinary winter oats, hence they should be used with caution until more information has been obtained as to their value.

Where the land is in a high state of fertility, none of the mixtures in use seems able to give a standing crop if heavy rain falls after about June 10. Under Suffolk conditions the crop is not usually mature enough to cut on that date, and it often gets badly laid, producing a good deal of rotten stuff at the bottom.

Mixtures such as those mentioned can usually be sown without much difficulty in the autumn, even on the most tenacious of soils. After the crop is removed, a half or pin fallow can be given if the land is not clean, or on heavy land, whilst on lighter soils, or loams, a catch-crop of turnips can usually be obtained. Thus the writer on one occasion weighed 15 tons of turnips (tops and roots together) after a silage crop, whilst a field of lightish loam near Lowestoft has been cropped according to the following rotation, since 1915.

1st year—tares and oats for silage, followed by turnips.

2nd year—barley, followed by tares and oats sown in autumn.

In this way three crops have been obtained every two years, with the exception of 1921, when the turnip crop failed owing to drought.

No opportunity has occurred of conducting silage-mixture trials on light land in Suffolk, but good silage has been made from rye and tares on land of this character. Mixtures containing rye, however, are not very popular amongst Suffolk farmers who chaff the green stuff—the rye gets too old and is difficult to cut up with certain types of chaffers and blowers—those in which the knives revolve rather on the lawn-mower principle.

Experiments in Essex were conducted at Bradfield Hall, Manningtree, and for particulars of the results obtained the writer is indebted to Mr. R. M. Wilson, B.Sc., and Mr. H. M. McCreath, B.Sc. The soil at Bradfield Hall is a light loam, very different in character from that of the Suffolk heavy clays. The results are particularly valuable on that account.

The mixtures tried were in most cases identical with those sown in Suffolk in the autumn of 1920. The best individual mixture at Bradfield Hall, both from the point of view of tons per acre and food units per acre, was one consisting of $\frac{1}{2}$ bushel rye and 2 bushels tares. The rye seems to hold up the tares better than other cereals, and consequently a longer growth of the tares is obtained. One bushel of rye included in the mixture, with 2 bushels of tares at this centre seemed to be too heavy a seeding of rye, and a consequent choking out of some of the

tares resulted. From this centre's results, also, wheat appears to be inferior to either rye or oats as an ingredient in a forage mixture.

Experiments with various tares mixtures have also been conducted at the Hertfordshire Institute of Agriculture, Oaklands, St. Albans. Mr. R. Rae, the Vice-Principal, states in his report that of four mixtures tried the heaviest yield obtained, 10½ tons per acre, was given by 2 bushels tares, ½ bushel oats and ½ bushel rye. He, however, does not consider that rye is a suitable ingredient for a silage mixture on the soil at the Institute, as it is ready for cutting before the other components of the mixture are at their maximum. The inclusion of beans in the mixture was found to improve the yield by more efficiently holding up the tares.

When the rather incomplete experiments available are considered in the light of much practical experience gained on the subject, upon a large number of farms, general conclusions as to tares mixtures suitable for heavy land may be arrived at with a fair degree of certainty. On the whole, upon land in a high state of fertility, where the crop is likely to go down, a mixture of 1 bushel of tares, 1 bushel of beans and 1 bushel of winter oats per acre has much to recommend it. A smaller proportion of beans and a larger proportion of tares will make the crop more likely to go down, but may be adopted by those who do not like bean silage.

On poorer heavy land a similar mixture may be adopted, or if preferred, the oats and beans may be reduced in quantity and 2 bushels of tares, ½ bushel of winter beans and ½ bushel of oats sown per acre. This mixture has the advantage that most of the plants present are of the leguminous family and hence it tends to enrich the land in nitrogen. On poor land, where a very heavy crop is not probable, a larger proportion of tares can be included in the mixture than on good land, where the crop is very likely to go down.

On light land a mixture of 2 bushels of tares and ½ bushel of rye per acre appears to be very suitable, but where rye is used, the crop must be cut fairly early, especially if a silage cutter with knives of the "lawn mower" type is used. Where the cutter used is of a type similar to the ordinary British chaff-cutter, a clearer cut is obtained, and the rye is more easily cut up. Where the crop is ensiled in a long state, a good proportion of rye does not matter so much.

Other crops which have been found more or less suitable for silage under British and Irish conditions :—

Beans alone.—Beans are quite commonly used in silage mixtures with tares and oats, but they have not often been used alone for silage purposes. A crop of beans was, however, made

into silage in a trench silo near Ardee and good silage resulted. Beans, being leguminous plants, would undoubtedly result in a silage containing a larger proportion of albuminoids. It may be mentioned, however, that it is considered by some that beans are not so palatable to stock as most other silage crops, and the precise value of beans alone as a silage crop is not fully known. Spring-sown beans are frequently affected by aphides or black "smother" fly, and when a bad attack occurs, the crop is often a complete failure from the point of view of corn production. It may be suggested that when a farmer finds his beans are badly affected by aphides, one of the best things that he could do would be to cut the whole crop and make it into silage, ploughing the land up immediately after. He would thus have a considerable bulk of valuable stock food, and would prevent his land from becoming full of rubbish.

It is worthy of note that as the ultimate object of many corn crops, such as beans, feeding peas, etc., is stock feed, it may prove an advantage to turn these crops into silage under certain circumstances, instead of allowing them to ripen the corn. When corn is ripened, one portion of the crop, the grain, becomes very digestible to stock, whereas another portion, the straw, especially in the case of beans, becomes indigestible, and is used principally for litter. It may sometimes happen that a larger quantity of actual digestible food for stock would be secured by making the crop into silage, than by allowing it to ripen.

Beans and Tares.—The question of tare mixtures has already been considered. There can be no doubt whatever that a mixture of beans with a few tares might be made; which would be suitable for silage, and which would stand up and make an excellent smother crop.

Beans and Peas.—The writer has not had an opportunity of trying such a mixture for silage purposes, but there seems every reason to believe that it would be suitable, and in certain seasons it should prove a very productive spring-sown crop, yielding a heavy weight of green material per acre.

In this connection it is interesting to note that seed mixture consisting of—

- 10 stones of beans
- 3 stones of vetches
- 3 stones of peas and

6 stones of oats per statute acre has been found suitable by Professor J. P. Drew,¹ at the Albert Agricultural College, Glasnevin, Dublin, and the silage resulting gave good results

¹ *Journal of the Department of Agriculture and Technical Instruction for Ireland*, August, 1923.

when fed to stock. This mixture stands up well and may be cut with the binder. A somewhat similar mixture, i.e. 3 bushels of beans, $\frac{1}{2}$ to 1 bushel of tares, $\frac{1}{2}$ bushel of peas and 2 bushels of oats (sown in spring) has been successfully used by Mr. Jas. Cruickshank, of Cruden Bay, Aberdeen.¹ The large quantity of seed used per acre under Irish and Scottish conditions is rather surprising to English readers.

Peas and Oats.—Excellent silage has been made on two Suffolk farms from mixtures of peas and oats, and there can be no doubt that such mixtures are quite well suited for silage purposes. The analyses of samples of this silage is given at the end of this article. In order to secure the maximum crop, suitable varieties of peas and oats must be chosen. Of the varieties of peas in common cultivation the Maple or Partridge pea seems to be most suitable. It is a long-strawed variety, and is rather late in ripening. The variety known as Black-eyed Susan is also fairly long in the straw and fairly suitable, but the Norfolk Early Dun pea is too short in the straw to produce enough green stuff.

As far as spring oats are concerned the grain-producing varieties such as Abundance, which are commonly grown in most parts of England, do not produce enough straw. They also have comparatively small capacity for tillering. Mr. J. C. Brown has found that for soiling, a local variety grown in Cumberland, Westmoreland, and the West Riding of Yorkshire, known as Dunn's oat, is most suitable. Failing this he recommends Clemrotheray, Blainslie, Sandy or Welsh grey oats. The Potato oat, which is so extensively grown in Scotland, also produces far more straw than the kinds commonly grown in England. There can be no doubt that any variety of oats or peas found to be suited for soiling will also be suited for silage. Mr. Brown suggested a mixture of 2 bushels of oats and 1 bushel of peas as the best proportions for sowing in early spring. In many parts of England the success of crops of this type depends largely upon whether they can be sown very early in the season—January or February. If they are sown late the oats will probably be attacked by Frit fly.

Lucerne.—In those parts of England where lucerne will grow, it must be regarded as one of our best silage plants, either when grown alone, or in combination with rye-grass or cocksfoot.

It may usually be cut three times in the season, the total green stuff obtained from the three cuts weighing probably 20 tons per acre. This crop is obtained with very little expenditure on manure, and as a "plant" of lucerne usually lasts six or seven years, the cost of the seed, divided over this period of years, is very small. Lucerne silage has been made by quite

¹ *Scottish Journal of Agriculture*, January, 1921.

a number of Suffolk farmers, and the writer has had an opportunity of examining it many times.

Possibly lucerne silage is not quite so good as a first-class sample of oats and tares silage, but it is satisfactory.

It is very important to place lucerne in the silo whilst young and green. If allowed to become old and stalky, inferior silage results.

Clover, and Clover and Rye-grass mixed.—Clover, either alone or mixed with grasses, makes excellent silage. Usually, however, it is better to make the first crop into hay, as is generally done in all parts of England. The crop is fit to cut in June or early in July, when there is a better opportunity to make hay, as a rule, than at any other time of the year. The second crop of clover, however, is in a different position altogether. In the Midlands and North of England, it is not usually fit to cut until the first week in September, and in a wet season not until late in September. As a result, the second crop of clover hay often gets damaged, and comes out of the stack "mouldy." The dews also, at that season of the year, often remain on the crop until midday, so that even in fine weather it is a very difficult matter to get it dry enough for carting. Under these circumstances it is a most useful plan to make second-crop clover or clover and rye-grass into silage. With clover and rye-grass, as with lucerne, it is most important not to allow the crop to become ripe and dry before placing in the silo, or mouldy silage and waste will result.

Maize.—Maize is grown as a fodder crop with considerable success in the southern and south-eastern counties of England. It is usually fed green to cattle, but it may be made into silage. In America maize is the most important silage crop, but in this country the varieties grown do not reach a sufficient degree of maturity to make the highest quality of silage, and considerable loss of sap due to the succulence of the crop is apt to result, unless special precautions are taken to prevent drainage, or the maize is allowed to lose some moisture by drying, before placing in the silo. This difficulty might be prevented by the introduction of more suitable varieties. The suggestion has been made that some of the excess of moisture present in the maize might be absorbed by mixing it in the silo with second-cut clover which had been cut two or three days, or even with chaffed straw. It is also an advantage to allow the maize to remain in shocks, in the field, for a few days, before chaffing.

Although there is considerable loss of weight in making maize silage, yet several farmers in the Eastern counties have of late years made considerable quantities of it, and have used it successfully with dairy cows and with sheep. On certain soils and in certain districts maize gives a heavier yield of green

material than any other crop, hence it may be sound practice to grow it for silage, in spite of the rather heavy loss that takes place in the process of ensilage.

As will be seen from the analysis given later, maize silage as made in England more nearly resembles mangolds in composition than any other kind of silage of which analyses are available, with the exception of Sunflower, which it closely resembles.

Of the value of maize silage as a food for stock, there can be no doubt. It has been fed not only to cows, but also very successfully to sheep. Thus, of the prizes awarded by the Suffolk Agricultural Association in 1923, to shepherds who reared, from not less than 200 ewes, the greatest number of lambs with the smallest loss of ewes, the first prize was awarded in respect of a flock which received roughly $\frac{1}{2}$ peck of maize silage per head daily in addition to turnips during the winter 1922-3. It is customary to commence trough-feeding breeding ewes about Christmas time, but as this flock was receiving silage, trough-feeding was not commenced until the second week in February. The third prize in the same competition was awarded in respect of another flock which also received a liberal allowance of maize silage during the winter.

Sunflowers.—Sunflower silage has been made to a limited extent in Great Britain. At the South-Eastern Agricultural College, Wye, Kent, seed was sown at the rate of 14 lb. per acre in June and yielded, when cut in September, about 20 tons of green material. At Cambridge University Farm sunflower silage was made in 1921, and the results with analyses, etc., were reported upon by Messrs. Amos & Woodman in the *Journal of Agricultural Science*, April, 1923. In 1920, a few acres of sunflower were grown for silage at Woodbridge, in Suffolk. The seed was sown in April at the rate of 7 lb. per acre, in rows, like mangolds. When cut on August 25, 20 to 25 tons of green stuff per acre were obtained. The crop was made into silage and was fed to cows during the winter at the rate of two-thirds of a bushel per day, with other foods, and satisfactory results were obtained. Since then sunflower silage has generally been made at Woodbridge. At Bibury, also, in Gloucestershire, an acre of sunflowers was grown from 7 lb. of seed on light shallow soil. An enormous crop was grown, and horses, pigs and store cattle all seemed to like the silage. Very favourable reports, too, have been received from the United States and Canada upon sunflowers as a silage crop.

It would appear from the information available that sunflowers are well worth a further trial in Great Britain as a silage and forage crop. It seems likely that they would thrive in districts which are too cold for maize. They also appear to

be a suitable crop for dry districts. It is worthy of note that sunflower seed usually costs very much less per acre than does a seeding of maize.

Lupins and Buckwheat.—These two crops seem rather promising for silage purposes, on very light land, as both will grow quite well on almost pure sand. Lupins are extensively grown in Suffolk for folding with sheep, and a mixture of lupins and buckwheat has also been found suitable for this purpose. Lupins are, however, somewhat poisonous and care must be used in feeding. Lupins alone have been made into silage on a small scale at Woodbridge, and it was found that sheep would eat the resulting material.

Grass.—In an average season there can be very little doubt that meadow grass is better made into hay than silage, especially in the drier parts of England. In such districts it is rather difficult to justify the laying aside of meadows for silage purposes, in view of the comparatively small yield of green grass obtainable per acre, when compared with arable land crops such as various tare mixtures and lucerne. In the moister districts of England, Wales, Scotland and Ireland much heavier yields of grass per acre may be obtained with suitable manuring on many, if not most soils, whilst the weather is also damper, and this makes the work of haymaking more trying and risky. Under these circumstances meadow grass may very well be made into silage. The quality of silage resulting is excellent, whether made in towers, trenches or stacks. In all probability meadow grass is more easily made into stack silage than is any other crop, as its close nature renders it possible to consolidate the sides and so keep out the air more easily than in the case of a more open material.

Inferior grass may be made into silage, and when this is the case it may be eaten more readily by stock than in its original state, or when made into hay. Thus in 1922, Mr. J. W. Riecard of Scots Hall, Westleton, Suffolk, who occupies a large area of marsh grassland, made some "skimmings" into silage in a trench. These "skimmings" are inferior grass which the stock will not eat when grazing the land, but which have to be removed in order to prevent the pasture deteriorating. In the usual way they are cut and made into hay which is used for litter. Mr. Riecard found that when made into silage store stock ate the silage quite well. It is not suggested that one can expect inferior grass to make good silage, but in this case the mixture was evidently more palatable as silage than in the form of either grass or hay.

It is evident from an examination of the subject that the British farmer has at his disposal quite a number of crops suitable for silage. Information upon the subject of the making of

silage under British conditions is gradually being acquired and disseminated. And when the economic aspects of the subject have been considered as fully as the technical problems, it may be expected that silage farming will prove of real benefit to the agriculture of this country and that it will help to keep the land under cultivation in the very difficult times through which the industry is passing.

In conclusion, the writer wishes to acknowledge his indebtedness to Messrs. C. C. Smith, E. Fred Gooding, H. Smith-Rewse, and J. Hepburn, who have conducted experiments with silage mixtures on their farms, and to many others who have contributed valuable information on the subject.

A. W. OLDERSHAW.

County Hall,
Ipswich.

ANALYSES OF SILAGE.

Materials used in making the Silage.	(1) Tares and Oats	(2) Tares and a few Oats	(3) Tares and Oats	(4) Tares and Oats	(5) Tares and Rye	(6) Tares and Rye
Moisture . . .	71.05	77.15	73.55	73.72	72.72	64.26
Oil or Ether Extract . . .	1.95	.97	1.87	2.68	1.30	1.56
Albuminoids . . .	2.35	2.24	3.10	2.89	2.77	3.87
Carbohydrates . . .	11.98	11.11	12.09	8.89	9.41	13.79
Fibre . . .	10.90	6.85	8.40	9.68	12.17	14.30
Ash . . .	1.97	1.68	1.49	2.64	1.63	2.19
Name and Address of Farmer	Mr. Postans, Hadleigh	E. R. Holland, Esq., Benhall Lodge, Saxmundham	Mr. C. C. Smith, Walton Hall, Felixstowe.	Mr. H. Fiske, Somersham, Ipswich.	Mr. H. Fiske, Bramford, Ipswich.	Mr. Makes, Colney, Norwich
Source of Analysis	Chelmsford (East Anglian Institute of Agriculture)	Cambridge (School of Agriculture)	Cambridge	Chelmsford	Chelmsford	Chelmsford
Type of Silo	Cylindrical Concrete	Trench or pit (made in very dry weather but water added)	Cylindrical Stave	Cylindrical Stave	Cylindrical Stave	Trench or Pit
Date of Analysis	Mar. 25, 1919	Feb., 1923	—	Mar. 25, 1919	Mar. 25, 1919	Feb. 16, 1923

Materials used making Silage	(7) Peas and Oats	(8) Peas and Oats	(9) Lucerne	(10) Second-crop Clover, Meadow Hay, and Maize	(11) Clover and Rye Grass	(12) Second-crop Clover with some Rye-grass and Cocksfoot
are . . .	72.00	72.45	62.37	68.06	81.41	77.17
or Ether tract . .	1.41	1.34	0.98	1.30	1.05	1.59
minoids	2.90	4.03	4.81	4.80	3.40	3.38
hydrates	14.10	13.37	17.08	11.53	5.28	9.14
! . . .	7.47	0.39	11.88	10.41	6.45	6.28
. . .	2.12	1.92	2.86	3.90	2.40	2.44
and Address of owner	Miss Gillett, Walpole Hatch, Halesworth	Mr. Boggis, Wrentham, Wangford	Mr. F. Gooding, Wltnesham, Ipswich	Mr. Kindred, Gt. Glenham, Saxmundham	Mr. J. Odershaw, Costock	Mr. J. Odershaw, Costock
se of analysis	Chelmsford	Cambridge	Chelmsford	Chelmsford	Chelmsford	Cambridge
of Silo	Cylindrical concrete	End of Barn	Cylindrical (wooden)	Rectangular concrete (old type)	French or Pit	Trench or Pit
of Analysis		Mar. 5, 1923	April 16, 1919	Mar. 29, 1919	Jan. 18, 1920	Jan. 19, 1923

Materials used making Silage	(13) Lupins	(14) Lupins and Buckwheat	(15) Marsh Grass	(16) Maize and Sunflower	(17) Sunflower	(18) Maize
are . . .	83.46	80.37	71.30	79.40	82.90	84.85
or Ether tract . .	1.25	1.53	1.64	1.07	.67	0.57
minoids	3.15	3.46	3.96	2.47	1.59	2.19
hydrates	4.13	6.23	11.93	6.97	7.75	6.31
! . . .	5.94	6.13	8.40	6.77	4.88	4.48
. . .	2.07	1.43	2.77	1.82	2.23	1.60
and Address of owner		Sir George Manners, Woodbridge	Mr. Blokeard, Seels Hall, Westleton	Mr. F. Smith, Woodbridge	Mr. F. Smith, Woodbridge	Mr. F. Smith, Woodbridge
se of analysis	Chelmsford	Cambridge	Cambridge	Cambridge	Cambridge	
of Silo			Trench or Pit	Cylindrical Stave (wooden)	Cylindrical Stave (wooden)	Cylindrical Stave (wooden)
of Analysis	Feb. 16, 1920		Feb., 1923	Mar. 5, 1923	Nov. 22, 1921	

NOTE.—The writer wishes to acknowledge his indebtedness to the School of Agriculture, Cambridge, and to the East Anglian Institute of Agriculture, Chelmsford, for the analyses given in this

THE SILAGE CONTENT OF TOWER SILOS AND SILAGE CLAMPS.

INTRODUCTION.

WITH the rapid development of ensilage in this country, knowledge of how to calculate with some degree of accuracy the quantity of silage contained in any silo becomes more and more important. The information is required by every farmer who contemplates the erection of a silo so that he may calculate what size to construct. It is required by every farmer who makes silage when calculating his stock-feeding programme at the beginning of each winter; and it is required at every farm valuation which includes silage. Indeed, numerous valuers have already consulted me upon this matter.

A good deal of information relating to experience in the early 'eighties is given in a book published by *The Field*, entitled *Silos for British Fodder Crops*. This book contains the experiences of numerous silage makers of those days from which the following are extracted: Mr. C. G. Johnson with grass silage, using a lever press in a silo 22 ft. deep and taking the sample 6 ft. from the bottom, obtained a density of 60 lb. per cubic ft.; this is the highest density recorded. The other extreme is that, recorded on page 332, from a pit silo belonging to Mr. W. Brougham, Culdulth House, Inverness; this silage, also of grass, was covered by boards, then weighted with 2 ft. of clay. When opened the top was found to weigh only 28 lb. per cubic ft., the middle 30½ lb., and the bottom 34 lb. On page 91 it is stated that M. Goffort, a Frenchman who was a silage pioneer of those days, had shown that his silage, "well compacted under heavy pressure," weighed rather over 500 kilogrammes per cubic metre, which is equivalent to about 50 lb. per cubic ft. Lastly the author, in summing up the matter, accepts a mean of 50 cubic ft. of silo capacity to be equivalent to 1 ton of 2,240 lb. of silage; this means that 1 cubic ft. of silage weighs 44.8 lb.

It must, however, be remembered that the silos used for silage at this period were different from the tall cylindrical silos of the present day.

Bailey,¹ an American farmer, writing of maize silage in 1881 states that a cubic foot of silage weighs 40 to 50 lb.

In *Modern Silage Methods*,² a book which gives much valuable information about silage, and is widely circulated in the United States, it is stated: "Corn (maize) silage will weigh from 30 lb. or less to toward 50 lb. per cubic ft., according to

¹ *The Book of Ensilage*, John M. Bailey. Orange Judd Co.

² *Modern Silage Methods*, published by the Silver Manufacturing Co.

e depth in the silo from which it is taken, and the amount moisture which it contains. We may take 40 lb. as an average weight of a cubic ft. of corn silage." This also draws attention to the fact that the weight per cubic ft. will vary with the amount of water in the silage, the depth of silage, the manner of filling, the character of the crop, and also the diameter of the silo.

King gives a table stating the computed weight of maize silage at different depths from 1 to 36 ft., from which the following are extracted¹:

Depth of Silage ft.	Weight of Silage lb. per cubic ft.
1 to 4	21.2
5 " 8	27.75
9 " 12	33.75
13 " 16	39.3
17 " 20	44.4
21 " 24	49.0
25 " 28	53.1
29 " 32	56.8
33 " 36	59.9

King also recognises that the weight of silage per cubic ft. is influenced by the percentage of water contained, as well as by the height and diameter of the silo, explaining that in a silo of small diameter the friction of the walls has a greater effect in preventing the settling of the silage.

It will be noticed that in none of the references quoted has any attempt been made to eliminate the most potent factor in causing variation in weight per cubic ft. of silage, namely, the percentage of water contained. Now this percentage of water in silage may vary from as little as 60 to as much as 80 per cent; in the former case 100 lb. of silage will contain 40 lb. of dry food, in the latter only 20 lb. It is therefore obvious that quantities of silage expressed in weight without reference to the percentage of dry matter may be misleading. In all the estimations made for this paper, therefore, the percentage of dry matter as well as the weight of silage were obtained. From this has been calculated the dry weight of silage, and from this again the weight which the silage would have possessed if it had been associated with the average quantity of water contained in silage; this approximates closely to 70 per cent. Each silage containing 30 per cent of dry silage has, for the purposes of this paper, been called "standard" silage. For purposes of valuation such "standard" silage may be regarded as possessing a value approximately equal to one-third its weight of hay, if one regards the dry matter in each food as having an equal value.

¹ *Physics of Agriculture*, King.

SILAGE IN TOWER SILOS.

Method of Investigation.—All the observations in this paper which refer to silage in tower silos were made in a wooden stave silo situated on the University Farm at Cambridge. This silo measures 30 ft. high by 12 ft. in diameter. The floor is composed of a concrete basin in the centre of which is a drain. The concrete wall to the basin is 14 in. high and 12 in. thick. The wooden staves forming the wall are embedded upon the centre of this concrete wall. Thus, below the foot of the wooden staves, the concrete wall juts into the silo like a shoulder instead of being quite "flush" with them. The importance of this point will be seen later in considering the packing of the silo within this concrete basin.

The method adopted has been to weigh out from the silo the entire quantity of silage used for feeding day by day. The height of the top of the silage was carefully measured before the weighings commenced and again at the end of each set of weighings. Care was taken to keep the surface of the silage level, especially when a measurement of the height was to be taken. In any case, such measurements are difficult to make with accuracy, so to keep the experimental error due to this cause as low as possible consecutive measurements were only recorded after 3 ft. or more silage had been taken from the silo. Samples of the silage, as weighed, were taken once a week and sent down to the laboratory for the determinations of percentage of dry weight.

In two years, 1919-1920 and 1922-1923, the whole content of the silo was weighed out in this way. In 1921-1922 ten sections only of the silage were so weighed.

1919-1920 *Experiment.*—The crop used this season was a spring-sown crop of oats and tares, planted at the rate of 1 bushels of tares and $1\frac{1}{2}$ bushels of oats per acre. Cutting commenced on August 4, when the crop was fairly mature, the oats just passing out of "milk," and the tare seeds beginning to dent the pods. Filling commenced on August 5 with the crop cut the previous day, and, in fact, all the crop except the last load was cut and "wilted" or dried for 24 hours or more before being carted to the silo. The drain in the silo was blocked with clay before filling commenced to prevent drainage, but in view of the drying of the crop before carting little sap would have been drained from the silo this season in any case. Filling proceeded very rapidly, and at the end of the third day the silo was filled 18 in. above the top to a height of 31 ft. 6 in. However, by the following morning the silage had settled, and space was found for six more loads, when the level of the silage again reached 31 ft. 6 in. Filling was thus completed within 4 days.

On August 9, and at frequent intervals until August 24, the

surface was well trampled, by which latter date the level of the top of the silage was 25 ft. 6 in. On October 24, when the silo was opened, it was found that the level had sunk still further 24 ft. 2 in., representing a settlement of no less than 7 ft. 4 in. at the time when filling was completed.

When opened it was found that there was 5 in. of spoiled silage on top, leaving 23 ft. 9 in. of good silage. The silage was used continuously until June 7, when the silo was empty. Table I gives the results, but does not take account of the spoiled silage on the top.

TABLE I.—1919-1920. *

Depth of Silage	Weight per cubic ft. Silage as removed	Average per cent. dry weight in Silage	Weight per cubic ft. dry matter in Silage	Weight per cubic ft. of "Standard" Silage
to 4 ft.	20.7 lb.	37.4	7.76 lb.	25.9 lb.
" 8 "	25.9 "	31.0	8.03 "	26.8 "
" 12 "	25.9 "	31.9	8.26 "	27.5 "
" 16 "	28.4 "	31.4	9.92 "	29.7 "
" 20 "	33.3 "	27.2	9.06 "	30.2 "
" 23 ft. 9 in. . .	33.8 "	24.8	8.36 "	27.9 "
Average	28.0 "	30.6	8.4 "	28.0 "

The first three columns in the table are self-explanatory. Column 4 is the calculated amount of dry matter per cubic ft. obtained by drying in a water bath at 100° C, but no attempt has been made to correct for volatile products other than water lost in drying, because these are insignificant in amount. Column 5 is calculated to express the weight of silage per cubic ft. assuming it had contained 30 per cent of dry silage, and represents, therefore, the weight of "standard" silage defined earlier in this paper as containing 70 per cent of water.

A study of column 3, giving the average percentage of dry matter in each 4-ft. layer of silage, shows great variation from as much as 37.4 per cent. in the top layer to as little as 24.8 per cent. in the bottom; this indicates that the weight per cubic ft. as recorded in column 2 by itself expresses an erroneous comparison between the quantities of food contained in each layer of silage.

Column 4, which gives the weight of dry silage, does give true comparison of the quantities of food contained in each layer, and shows that there is a steady increase in each layer from the top to the fifth layer, from 7.76 lb. dry silage per cubic ft. to 9.06 lb. in the fifth layer. The lowest layer of silage does not show the same increase, probably on account of the peculiar construction of the wall at the bottom of the silo; the con-

crete shoulder at a height of 14 in. projecting 4 or 5 in. into the centre of the silo beyond the stave walls naturally preventing close packing at the bottom of the silo.

Column 5, "standard" silage, shows similar features to column 4, and shows that the weight per cubic ft. of "standard" silage containing 30 per cent. dry matter varied between 25.9 lb. in the top 4-ft. layer and 30.2 lb. per cubic ft. in the fifth layer. These figures are on the low side, partly because the silo was filled very rapidly and without much time for fermentation and settling, but mainly because the crop was fairly mature and allowed to "wilt" and dry before being ensiled.

The quantity of good silage contained in the silo this season has been calculated from the above figures to be equivalent to 33½ tons of "standard" silage. It must, however, be recognised that, at the time of using, the silo was only four-fifths full, and had the filling been more protracted, or had a second filling been superimposed at a later date (as is sometimes the case in practice), the amount of silage held by the silo would have been considerably increased.

1922-1923 *Experiment*.—In this year the silo was filled with an autumn-seeded mixture of oats, beans and tares in the proportion of 2 parts oats, 1 part beans, and 1 part tares at the rate of 3 bushels per acre. The crop was a fine one, and was ensiled at a comparatively early stage of maturity, cutting commencing on June 22. At this date the oats were barely in milk, the tare pods were only 1 to 2 in. long, though the beans were well podded with seeds half-grown. The weather previous to cutting had been very dry, but during cutting and filling there were frequent light showers. The crop was ensiled soon after cutting, either the same day as cut or next-day morning. The time occupied in filling the silo lasted intermittently from June 22 to July 1, a period of ten days. On the last day the silo was filled to a level of 29 ft. 6 in. Thereafter for a period of a fortnight the silage was frequently trampled. The longer period of filling associated with the more succulent and moist condition of the crop naturally led to denser packing of the silage, and in the interval between completion of filling on July 1, when the level of silage was 29 ft. 6 in., and the commencement of using on November 3, when the level of the silage was 24 ft. 3 in., the silage had only settled 5 ft. 3 in. as compared with a settlement of 7 ft. 4 in. in 1919-1920. This shows that an extended period of filling, together with a more succulent crop, results in better use of the capacity of the silo. On opening the silo, there was found to be 9 in. of spoilt silage on top, thus leaving 23 ft. 6 in. of good silage.

The drain in the floor of the silo was kept open this season, and, in fact, 1,204 gallons of silage juice were squeezed out and

measured as drainage. This large amount of drainage was due to the succulent condition of the ensiled crop, and represents a considerable wastage of food material.

Table II gives the results obtained in similar form to Table I, except that each layer represents a depth of 3 ft. instead of 4 ft.

TABLE II.—1922-1923.

Depth of Silage	Weight per cubic ft. Silage as removed	Average per cent, dry matter in " Silage	Weight per cubic ft. dry matter in Silage	Weight per cubic ft. of " Standard " Silage
0 to 3 ft.	27.5 lb.	33.1	9.1 lb.	30.3 lb.
3 " 6 "	35.7 "	33.3	11.9 "	39.7 "
6 " 9 "	42.4 "	27.9	11.9 "	39.7 "
9 " 12 "	50.5 "	29.4	14.9 "	49.7 "
12 " 15 "	50.3 "	27.9	14.0 "	46.7 "
15 " 18 "	50.5 "	27.9	14.0 "	46.7 "
18 " 21 "	56.7 "	27.5	15.6 "	52.0 "
21 " 23 ft. 6 in.	40.5 "	26.2	10.6 "	35.3 "
Average	44.2 "	29.2	12.8 "	42.5 "

Table II shows some points of similarity to Table I in that the variations in percentage of dry matter in the silage at different levels are considerable, and that columns 4 and 5, giving the weight per cubic ft. of dry silage and of "standard" silage, show a progressive increase from above downwards except in the case of the lowest layer, where the concrete shoulder interferes with consolidation, but the actual weights per cubic ft. of silage, whether natural, dry, or "standard," are markedly different. The average weights per cubic ft. of silage as weighed from the silo amounted to 44.2 lb. and of "standard" silage to 42.5 lb., and compare very favourably with the corresponding figures of 28 lb. and 28.6 lb. obtained in 1919-1920. They show that the quantity of food contained per cubic ft. has been increased by almost 50 per cent. under the altered conditions of filling. The former may be regarded as typical of loosely-packed silage, the latter of silage rather more than normally closely packed. The total quantity of good silage calculated as "standard" silage contained in the silo this season amounted to 50½ tons, a quantity again which is almost 50 per cent. greater than that of 1919-1920 and due to better conditions of packing.

It is perhaps interesting to comment in passing that the average per cent. of dry matter in the silage in both years approximates very closely to the percentage adopted for "standard" silage, being 30.6 in 1919-1920 and 29.2 in 1922-1923, though the variation in different layers is as wide as 24.8 per cent. in the bottom layer to 37.4 in the earlier year.

1921-1922 *Experiment.*—In 1921-1922 it was found possible only to weigh out from the silo two sections of 3 ft. each. In this year the crop consisted of autumn-planted oats and tares grown in the dry season of 1921; the crop was cut at an early stage of maturity, the tares being in full flower and the oats just in milk. Cutting and filling were carried through very rapidly between June 21 and 23 inclusive. The crop was ensiled as soon after cutting as possible so that "wilting" was reduced to a minimum.

TABLE III.

Depth of Silage	Weight per cubic ft. Silage as removed	Average per cent. dry matter in Silage	Weight per cubic ft. dry matter in Silage.	Weight per cubic ft. of "Standard" Silage
6 to 9 ft.	34.3 lb.	33.5	11.5 lb.	38.3 lb.
15 " 18 "	46.0 "	31.5	14.5 "	48.3 "
Average	40.1 "	32.5	13.0 "	44.3 "

It will be seen that the figures shown in Table III approximate closely with those given in Table II for silage at corresponding levels; thus the silage at 6 to 9 ft. contains 38.3 lb. per cubic ft. of "standard" silage compared with 39.7 in Table II, and at 15 ft. to 18 ft. contains 48.3 lb. compared with 46.7 lb. The close agreement between these figures for 1921-1922 and 1922-1923 indicates that close packing of the final product is probably associated more closely with succulent nature of the crop, which character was common to both seasons rather than to duration of filling, for in 1921-1922 filling lasted only 3 days. Probably duration of filling influences the quantity of crop that can be crammed into the silo rather than the weight per cubic ft. after settling has finished. Unfortunately no record was taken this season of the amount of settling which occurred, but I have records of other and larger silos in which filling lasted 3 to 4 weeks, and the settlings after filling were less than 4 ft.

CONCLUSIONS IN REFERENCE TO SILAGE IN TOWER SILOS.

1. That the weight of silage without reference to the percentage of dry matter contained does not give a reliable indication of food value. Estimates of quantities of silage should be stated either as dry silage or a "standard" silage containing 30 per cent. of dry matter, which approximates closely to the composition of average silage.

2. That the state of maturity of the crop, as well as the dryness of the crop occasioned by wilting or other causes, are

important factors in determining the density of silage. Crops put in a state of early maturity without "wilting" settle much more compactly in the silo, and thus enable the silo to contain much greater quantities of food.

3. That too rapid filling of the silo, especially with mature crops, gives insufficient time for fermentation and settling in the silo, and so leads to wasteful use of the accommodation for storage in a silo.

4. That the density of silage in a silo increases with the depth of the silage.

5. In estimating the contents of a silo consideration should be given to all these points. The results so far obtained indicate that the density of the top 10 ft. of silage varies between 25 lb. of "standard" silage for loosely compacted silage to 35 or 40 lb. of "standard" silage when closely compacted. And that in the second 10 ft. of silage the figures vary between 30 lb. of "standard" silage when loosely compacted to 45 or 50 lb. when closely compacted.

No evidence has been obtained at depths greater than those mentioned, but it is reasonable to suppose that some increase in density would be obtained beyond the figures mentioned for the second 10 ft.

CLAMP SILAGE.

The cases about to be described of clamp silage refer to silage made generally in the fields in which the green crop was grown. Preparation was first made for the clamp by excavating a rectangular pit to a depth of 18 to 30 in. The green crop was carted into the pit and the clamp constructed just as a drawn-over dung-heap is made. Finally the earth excavated from the pit was thrown on the top of the clamp to consolidate and compress the whole, the depth of earth, except where otherwise stated, being about a foot thick.

Method.—The method adopted in estimating the density of silage in these silage clamps consisted firstly in removing the earth and then the spoilt silage on the top of the clamp from a rectangular area varying in different cases from 24 in. to 40 in. Using a hay-knife and making vertical cuts, a rectangular column of silage was then cut out from above downwards until the floor of the silo was reached. The whole of the silage so removed was carefully weighed, and a sample taken for determination of its dry weight. The cubical space occupied by the silage was carefully determined by measuring the cross section of the column at intervals of 6 in. (since the cutting with the hay-knife inevitably varied slightly from the vertical), and then multiplying the mean cross section by the depth of silage cut out. The results obtained are stated in Table IV.

TABLE IV.—DENSITY OF SILAGE IN CLAMPS.

Crop	Date of Making	Date of Sampling	Depth of Silage		Weight per cubic ft.	Per cent. of Dry Matter	Weight of Dry Silage per cubic ft.		Weight of Standard Silage per cubic ft.
			ft.	in.			lb.	lb.	
1. Clover and Rye grass. (3rd crop)	Sept. 1919	Dec. 19, 1919	5	2	34.7	36.5	12.7	42.6	
2. Clover and Rye grass. (3rd crop)	Sept. 1920	Dec. 23, 1920	5	2	31.0	38.6	12.3	41.0	
3. Oats coming into ear	May, 1921	Aug. 27, 1921	4	3	50.2	23.0	13.6	45.3	
4. Oats and Tares	June, 1921	Jan. 9, 1922	4	3	38.0	33.3	14.5	48.3	
5. Oats passing out of milk	June, 1922	Sept. 5, 1922	3	4	29.0	27.5	8.2	27.3	
6. Oats, Tares and Rye	June, 1923	Jan. 15, 1924	3	10	42.9	21.1	8.0	29.6	
Average					39.3	30.8	11.7	38.2	

Table IV gives the results of weighings from six silage clamps. Nos. 1 and 2 refer to third crops of clover and ryegrass grown on my father's farm at Wye in Kent. In both cases the crop when cut was young, being just in flower, and rather succulent. In each case the crop was allowed to wilt after cutting for 2 hours or more, and hence the percentage of dry matter in each case is high. When calculated as dry silage a cubic ft. in each case contained about 12½ lb. of dry material, and as "standard" silage of 30 per cent. dry matter each cubic ft. contained 41 and 42 lb. respectively.

Clamp No. 3 was made from a crop of oats also at Wye. These, growing on very fertile soil, went down flat early in May. They were cut when coming into ear and clamped in a very succulent condition, hence the heavy weight per cubic ft. of silage as taken from the silo, 59.2 lb., and the low percentage of dry matter. The calculated weights of dry silage per cubic ft. 13.6 lb., and "standard" silage, 45.3 lb., are not widely different from Nos. 1 and 2. This case provides a good illustration of the errors involved in estimating the quantity and feeding value of silage by weight only, without reference to the percentage of dry food which silage contains. Incidentally, it may be remarked that the silage produced from these immature oats was very sour.

Clamp No. 4 was made from oats and tares grown upon the Government Experimental Farm at Methwold in Norfolk. It was cut from a crop of oats and tares, in which the tares were well podded and the oats in milk. The clamp was heavily weighted with nearly 2 ft. of soil. The silage from this clamp though weighing only 38 lb. per cubic ft., when taken from the

It was found to be the densest clamp measured; 1 cubic ft. contained 14.5 lb. of dry silage, or 48.3 lb. of "standard" silage per cubic ft.

Clamp No. 5 was made like No. 3, from a laid crop of oats at Wye, but in this case the crop was more mature, the oats being well advanced in milk and consequently relatively dry when compared with No. 3. The weight per cubic ft. of silage as taken from the silo, just less than 30 lb., is barely one-half that of No. 3, in which the oats were cut very early. This is due in part to the drier nature of the crop, but probably in greater part to the more mature and coarser condition of the oat straw, which prevented the silage from packing tightly. The weight per cubic ft. of dry silage, 8.2 lb., and of "standard" silage, 13 lb., are very low, and due to the mature nature of the crop when cut.

Clamp No. 6 was made on the Cambridge University Farm in 1923 from mixtures of oats, tares and rye; of these the oats were in milk, the tares just passing out of flower, but the rye was rather mature and stalky. The clamp was only lightly covered with a layer of 6 in. of soil. The weight per cubic ft. of good silage as removed from the clamp was 42.9 lb., but the silage was very wet, containing only 21.1 per cent. of dry silage, so that the weight of "standard" silage per cubic ft. was only 9 lb. This comparatively low figure is due in part to the maturity of the rye and in part to the small covering of soil.

It will be noticed that the extreme variations of weight per cubic ft. of "standard" silage are between 27.3 lb. for loosely compacted, and 48.3 lb. for closely compacted, silage, and that the average of the six cases is 38.9 lb. These figures are not widely different from those obtained for silage in tower silos, and from those quoted from earlier investigators. For silage of average compactness, therefore, we may assume in round figures that 40 lb. represents its weight per cubic ft., for silage loosely compacted the weight may be 30 lb. or less, and for closely compacted silage that the weight may rise to 45 lb. or more.

CONCLUSIONS IN REFERENCE TO CLAMP SILAGE.

1. That the weight of silage without reference to the percentage of dry matter contained does not give a reliable indication of its food value. Estimates of quantities of silage should be stated in terms of "standard" silage, containing 30 per cent. of dry matter.
2. That the state of maturity of the crop and its dryness are important factors in determining the density of clamp silage.
3. That in calculating the quantity of silage in a clamp silo after computing the cubical contents of good silage, the equivalent of "standard" silage will be obtained by multiplying the

number of cubic ft. by 30 lb. in the case of loosely compacted silage up to 45 lb. in the case of closely compacted, and by 40 lb. in the case of average compactness.

In conclusion, I desire to record my appreciation of the care and zeal with which Mr. W. M. Davies in 1919-1920, Mr. H. V. Garner in 1920-1921, and Mr. I. A. F. Pretty in 1922-1923, carried out the tedious and laborious work of weighing the silage as it was thrown out of the tower silo day by day.

ARTHUR AMOS.

School of Agriculture,
Cambridge.

BEEF PRODUCTION.

THE production of beef, as the preferred consumable under stands that excellent comestible, is a commodity which has been an essentially British industry. In the days of the old field system of agriculture it was unknown. Young stock of these days were fed, or rather starved, during the winter on stubble or pasture eked out with a little hay or straw. The following summer's grass restored their condition, and perhaps in good seasons enabled them to put on a modicum of flesh and fat. In the autumn they were slaughtered wholesale and salted down for winter use. Such animals, together with oxen which had done their turn at the plough, and cows which had ceased to breed, provided what we now refer to as the "roast beef of old England."

It was not until enclosure made possible the adoption of the four course, or some similar rotation, including the large scale culture of turnips and swedes, that beef production as now understood became a general practice. Turnips had been introduced as a garden crop immediately after the Reformation but they were not grown as an agricultural crop until enclosure had been generally adopted in the latter half of the eighteenth century. As turnip culture spread it was followed by white beef production; in fact, the two practices spread together—turnips and swedes providing an abundant supply of succulent fattening food for cattle in the winter.

Marshall, in his volume on Norfolk, written in 1783, describes at great length the cultivation of the turnip and swede crop and devotes much space to what he calls their application, by which he means their use for fattening cattle in the winter. Between this date and 1830 this subject was a favourite theme

with agricultural writers, who dilate at length on the breeding and buying of the cattle, their rate of growth, and how to treat them when they choke. There are, however, few references before 1830 to the inclusion in the winter ration of anything except turnips or swedes and straw, and of the latter Marshall says, the best feeders gave their cattle "only enough to clean their mouths."

I am indebted to my colleague, Professor R. H. Biffen, for reference to the use of concentrated feeding stuffs at this period. In the article on Flax in *The Complete Farmer* (Edition 177), it is stated that "the cakes of linseed, after the oil has been pressed out of them, are likewise found to be useful for this last purpose (fattening), though they are thought to render the fat of cattle yellow: for which reason it is advised not to give them till within a few weeks before the beasts are to be killed."

It appears, therefore, that winter beef was produced a century ago on a ration consisting exclusively of turnips or swedes and straw. On such a ration an average 3- or 4-year-old steer, such as was used for winter fattening at that period, would consume per day 200 lb. of swedes or 300 lb. of turnips and about 1 lb. of straw, which would supply $2\frac{1}{2}$ lb. of crude protein, or to $\frac{1}{3}$ lb. of real protein, and about 15 lb. of starch equivalent. Such a ration would suffice for the fattening of adult animals such as were used in those days.

Up to this period, agricultural writers for the most part described what they considered to be the best practice they saw in their tours and travels, and there are few references to what one may call organised experiments. Indeed, it was not until the nineteenth century was well started that the experimental period began with Coke of Norfolk, the Duke of Bedford, and many other landowners. Then came the foundation of the Rothamsted experimental station by Sir John Lawes, also a landowner, and the institution of experimental investigations by the great Agricultural Societies. It was in these early years of the eighteenth century too that chemical analysis began to be widely applied to feeding stuffs.

The result of these activities was the rapid spread of knowledge about the nutrition of animals. In 1839, Mr. Stevenson of Haddington described in the *Journal* of the Highland and Agricultural Society an experiment on the feeding of cattle. He fattened three lots of cattle—one on turnips and straw only, one on turnips and straw with the addition of corn, and a third on turnips, straw and corn with the addition of linseed cake. He records a profit of 22 per cent. on the lot fattened on turnips and straw. The addition of corn reduced his profit to $8\frac{1}{2}$ per cent., and with the further addition of linseed cake his profit disappeared and was replaced by a loss of $12\frac{1}{2}$ per cent. He

concludes by remarking that farmers who wish to supplement the usual ration of turnips and straw will be well advised to confine themselves to home-grown corn such as oats and beans, and to avoid such expensive articles as linseed cake, which he priced at three farthings per lb. or £8 17s. 6d. per ton. From which we may conclude that even as late as 1840 the use of purchased feeding stuffs was the exception rather than the rule.

About this time the application of chemical analysis to the study of animal nutrition had shown that the flesh of animals was rich in proteins, or, as they were called at that time, albuminoids: also that roots and straw contained only small proportions of these constituents. From these undoubted facts, certain continental investigators jumped to the rather hasty conclusion that it was necessary to add to the ration of all kinds of animals large quantities of concentrated feeding stuffs rich in proteins or albuminoids in order to make up for the deficiency of these constituents in such home-grown fodders as roots and straw. These conclusions were embodied in the feeding standards laid down by certain continental authorities and reprinted in almost every agricultural text-book.

From this time onwards over 200 feeding trials have been recorded in British Agricultural Journals. All of these trials had practically the same object, namely, to test the effect of various concentrated feeding stuffs as additions to roots and straw for winter beef production. Practically all of them accepted the continental feeding standards with their high content of proteins or albuminoids. No one seems to have questioned the efficacy of proteins for fat production; indeed, with one exception no really fundamental work on animal nutrition was carried out in this country before 1900. The exception was the work done by Lawes and Gilbert at Rothamsted between 1850 and 1860, work which was accepted by physiologists throughout the world, but ignored or misunderstood by agriculturists both scientific and practical.

Lawes and Gilbert's work on animals proved two most important points, namely, (1) that in fattening an animal most of the fat produced is formed from the carbohydrates in the food—starch and sugar—and not from the proteins and fats or oils; (2) that however much protein an animal eats, very little is retained in its body to form lean flesh, nearly the whole of its nitrogen being excreted at once in the dung and urine. The first point was entirely ignored in agricultural practice, the second interpreted to mean that protein was doubly beneficial because not only did it fatten the animal, but it also enriched the manure.

As a result of all this a system of winter beef production

was developed, in which the original root and straw ration was supplemented with very large quantities of purchased feeding stuffs, such as linseed and cotton cakes, and these cakes were often given to cattle fattening in the summer even on good grass land. Although this excessive use of concentrated feeding stuffs was checked by scarcity during the war, it is being again adopted, and the subject is ripe for reconsideration.

Lawes and Gilbert's work, already quoted, showed seventy years ago that the carbohydrates of the food form the main source of the fat produced in an animal's body. More recently, only thirty-five years ago, Kellner, at the Möckern experiment station, in Germany, measured with great accuracy the fat-producing value of proteins, fats and carbohydrates, and found that weight for weight carbohydrates produced more fat than proteins. At the same time he also worked out a method for measuring the fat-producing value of all kinds of foods and fodders, expressing his results as the number of pounds of starch which would produce as much fat in the body of a store bullock as 100 lb. of the food or fodder. These figures, which Kellner called starch values or starch equivalents, have recently been reprinted by the Ministry of Agriculture in a small pamphlet, *Rations for Livestock*, Miscellaneous Publication, No. 32, price 6d. post free. They are given in the tables at the end of the pamphlet, column 15, under the name of Net Digestible Energy. These starch equivalents are by far the most reliable measure of the fat-producing value of feeding stuffs. From Kellner's measurements, 1 lb. of starch equivalent will produce $\frac{1}{4}$ lb. of fat. Consequently the starch equivalent per 100 lb. divided by 4 will give the weight of fat which 100 lb. of the feeding stuff may be relied upon to produce. Thus:—

Name of Feeding Stuff	Starch equivalent per 100 lb.	100 lb. of the Feeding Stuff will produce, lb. fat
Turnips	8.5	2.1
Swedes	11.5	2.9
Good pasture	12.7	3.2
Good hay	40.4	10.1
Oat straw	17.0	4.2
Maize	81.4	20.3
Oats	59.5	14.9
Barley	71.0	17.7
Beans	65.8	16.4
Linseed cake	74.0	18.5
Common cotton cake	40.0	10.0
Palm kernel cake	74.9	18.7
Ground nut cake	73.0	18.2
Bran	45.0	11.2
Middlings	64.0	16.0

Having measured or computed the starch equivalents of about 300 feeding stuffs, Kellner proceeded to follow the example of the earlier German investigators by publishing a series of feeding standards for all kinds of livestock, his rations being stated in terms of starch equivalent. For some reason or other Kellner's standards never caught on in this country, and the rations commonly used for beef production by British farmers are those which have been inherited from the earlier continental standards of about fifty years ago. These earlier standards ignored the work of Lawes and Gilbert on the great fattening power of carbohydrates, and they were in use twenty years before Kellner's work was published. Consequently they prescribed far too much protein, and the use of excessive amounts of protein is the common mistake of present-day beef producers.

Now it is easy to criticise existing methods, but such criticism is not of much use unless it is accompanied by constructive suggestions for improvement. Fortunately, facts have been discovered recently which make such suggestions possible. The greatest advance which has recently taken place in the feeding of livestock is the method of rationing dairy cows according to their milk yield. The pioneers of this method in England are Mr. James Mackintosh of the National Dairy Research Institute at Reading, and Mr. G. H. Garrad of Kent. The essence of the method is to give each cow a maintenance ration computed according to her weight, adding to it a production ration computed according to her milk yield. It is quite possible, and indeed quite practicable, to ration for beef production on similar lines, giving up the idea of a standard ration, and computing the ration which will produce the desired amount of live weight increase and fattening.

The maintenance ration can be computed, as in the case of cows, according to live weight, and the production ration according to the live weight increase which the owner expects his bullocks to put on. A complication, however, arises from the fact that live weight increase varies in composition. When a bullock in store condition is given a fattening ration, he begins at once to put on live weight increase. The composition of this increase has been ascertained in several ways. Much of it is water, but it contains also some fat and some protein. From its composition it appears that 1 lb. of such increase can be produced by $2\frac{1}{2}$ lb. of starch equivalent. Most owners would be satisfied if their stores, when put up to fatten, increased at the rate of 2 lb. per head per day. To produce this rate of increase the production ration must supply 5 lb. of starch equivalent. The maintenance ration of a 9-cwt. store bullock is 6 lb. of starch equivalent. The protein requirement of such an animal is 1.5 lb. per day of digestible protein, which is little

more than half the amount included in the rations in common use.

The maintenance ration should be given mainly as hay, straw, or other coarse fodder. The starch equivalent of good hay is 40 lb. per 100, or .4 lb. per lb. Consequently, 15 lb. of good hay will supply the 6 lb. of starch equivalent necessary for maintenance.

Coarse fodder is not suitable for production because it is so bulky that an animal cannot eat enough of it. Roots, however, are excellent for this purpose, and since 100 lb. of swedes contain 7.3 lb. of starch equivalent, 70 lb. of swedes will contain the 5 lb. of starch equivalent necessary to produce 2 lb. of live weight increase in a store bullock.

The ration for a 9-cwt. store will therefore be:—

RATION I.

For maintenance 15 lb. good hay.
For production of 2 lb. L.W.I. . 70 lb. swedes.

This ration should now be checked to ascertain if it supplies enough digestible protein. Good hay contains 9 per cent. and swedes 1 per cent. of digestible protein. The ration therefore supplies:—

15 lb. hay at 9 per cent. contains .	1.35 lb. dig. prot.
70 lb. swedes at 1 per cent. contains .	.7 " "
	<hr/>
	2.05 " "

which is well over the daily protein requirement of a 9-cwt. store bullock, and the ration is therefore satisfactory in this respect, and does not stand in need of any addition of cake of any kind. Such a ration will produce a daily increase of 2 lb. live weight provided the hay is really good hay and the animals are in store condition. It would, however, only be a practicable ration when hay is abundant and cheap.

Usually this would not be the case, and the only coarse fodder available would be, say, barley straw. Now the starch equivalent of barley straw per 100 lb. is only 20. Consequently, 5 lb. of barley straw would only supply 3 lb. of starch equivalent, and it is not practicable to expect the animal to eat more because it is too bulky. Another 3 lb. of starch equivalent is therefore required to complete the maintenance ration, and this can be most cheaply supplied in the form of 40 lb. of swedes. The 5 lb. of starch equivalent required for production can be supplied as before in the form of 70 lb. of swedes, when the complete ration will be:—

For maintenance 15 lb. barley straw.
" " 40 lb. swedes.
For production of 2 lb. L.W.I. . 70 lb. swedes.

Barley straw contains only .8 per cent. of digestible protein.
The ration will therefore supply :—

15 lb. barley straw at .8 per cent. . .	.12 lb. dig. prot.
110 lb. swedes at 1 per cent. . .	1.1 " "
	<hr/>
	1.22 " "

which is .3 lb. below the requirement of 1.5 lb. per head per day. This deficiency can be made good by 2 lb. of Bombay cotton cake, which will be useful in preventing the high root ration from scouring the animals, or by 1 lb. of cotton cake and $\frac{1}{2}$ lb. of linseed cake, or in many other ways, 10 lb. of roots being deducted as the equivalent of the additional cake. The complete ration will now read as follows :—

For maintenance . . .	15 lb. barley straw.
" " . . .	40 lb. swedes.
For production . . .	60 lb. swedes.
" " . . .	1 lb. cotton cake.
" " . . .	$\frac{1}{2}$ lb. linseed cake.

This looks a large ration, and the question arises whether the animals will eat it. The best measure of the bulk of a ration is the amount of dry matter it contains. Barley straw contains 86 per cent. of dry matter, swedes 11.5 per cent., and cake about 90 per cent. The ration therefore contains :—

15 lb. barley straw at 86 per cent. =	13 lb. dry matter
100 lb. swedes at 11.5 per cent. =	11.5 " "
1 $\frac{1}{2}$ lb. cake at 90 per cent. . . =	1.3 " "
	<hr/>
	25.8 " "

This is rather more than the average 9-cwt. store bullock will eat in a day. In a yard of such bullocks supplied with such a ration some will eat the whole and will put on their 2 lb. live weight increase per day. Others will leave some of the straw and their rate of increase will not reach the expected 2 lb. per day. This is the difficulty usually encountered when fodder is used which contains so little starch equivalent for its bulk as barley straw. The best way out is to supply weighed rations of roots and cake, and to give the animals access to an abundant supply of straw from which they will themselves select the softer portions such as the leaves and bits of clover which are less fibrous and more digestible and consequently contain more starch equivalent in less bulk. The stems left over will in due course be trodden down for litter.

As fattening progresses, the composition of the live weight increase gradually changes. Each successive addition of increased weight contains less water and protein and more fat

Consequently as the animal gets fatter, more starch equivalent is required to produce a given increase. Armsby estimates that in the case of a half-fat animal 3 lb. of starch equivalent are required in order to make 1 lb. of live weight increase. On this basis it is possible to work out a ration which will enable a half-fat bullock weighing, say, 11½ cwt., to put on 2 lb. live weight increase per day. Such an animal will require a maintenance ration containing 7 lb. of starch equivalent. Towards this he might get 20 lb. of barley straw, which would supply 4 lb. of starch equivalent. The remaining 3 lb. might be given in the form of, say, yellow fleshed globe or tankard mangolds, the starch equivalent of which per 100 lb. is 7. The maintenance ration would then consist of 20 lb. of barley straw and 45 lb. of mangolds. To produce 2 lb. of live weight increase per day in such an animal 6 lb. of starch equivalent would be required, and this could be supplied in the form of 85 lb. of mangolds. The total ration now adds up to 20 lb. barley straw and 130 lb. of mangolds. It will contain the following amounts of dry matter and digestible protein :—

	Dry Matter	Digestible Protein
20 lb. barley straw at 86 per cent.	= 17.2, at .8 per cent. =	.16
130 lb. mangolds at 13 per cent.	= 16.9, at .7 per cent. =	.91
	<hr/> 34.1	<hr/> 1.07

This ration contains about 7 or 8 lb. more dry matter than the kind of animal in question would consume, and it is deficient in digestible protein to the extent of about ½ lb. It would be quite simple to increase the protein by substituting 2 to 3 lb. of cake or cake mixture for 20 lb. or so of mangolds, but this would not materially reduce the bulk of the ration. It is this matter of bulk which is responsible for the chief difficulty in computing rations for animals as they advance in fatness, and consequently require more food to maintain their full rate of increase.

There are two ways out of the difficulty. The usual way is to continue the ration as computed for store animals, in which case, as the animals increase in weight, more of their food is used for maintenance, and as they increase in fatness more of their food is required to make each successive addition to their live weight. In these circumstances their rate of live weight increase falls off. An example will make this clear.

The ration computed above for 9-cwt. store bullocks was :—

15 lb. barley straw, containing	3	lb. starch equivalent
100 lb. swedes, containing	7	" " "
1½ lb. cake, containing	.8	" " "
	<hr/> 10.8	" " "

If such a ration were continued to a half-fat bullock weighing $11\frac{1}{2}$ cwt., 7 lb. of the starch equivalent would be used up for maintenance, leaving only 3.8 lb. for the production of live weight increase. Since in a half-fat animal 3 lb. of starch equivalent is required to make 1 lb. of live weight increase, the rate of increase would only amount to $1\frac{1}{4}$ lb. per day. This is the normal course of events with many winter feeders. They start their animals on a ration suitable for stores which for the first month or two gives a normal rate of increase of 2 lb. live weight per day. Maintaining the same ration, as the animals increase in weight and get fatter, the rate of live weight increase falls off until finally it practically ceases. In many cases the animals are given access to unlimited straw and roots, but the bulk of these fodders sets a limit to the amount consumed which prevents the original rate of live weight increase being maintained. This method of fattening cattle is perfectly sound and economical so long as the ration computed for the stores does not contain an excessive amount of expensive cake and meal. It produces beef quite fit for market at a reasonable cost if the animals are sold for slaughter before their rate of live weight increase falls to an unprofitable level, say, after about four months' feeding.

The other way out of the difficulty is to reduce the amount of the most bulky and unpalatable constituent of the ration, replacing it by something which supplies the maximum of starch equivalent in the minimum bulk, that is to say, some kind of concentrated food. The following ration is worked out on these lines :—

RATION II.

	Dry Matter	Starch Equiv.	Dig. Protein
	lb.	lb.	lb.
10 lb. barley straw, containing . .	8.6	2.0	.08
70 lb. mangolds " . .	9.1	4.9	.49
6 lb. maize " . .	5.2	4.0	.43
2 lb. linseed cake " . .	1.8	1.5	.51
	24.7	13.3	1.51

Such a ration would be within the capacity of a half-fat bullock weighing $11\frac{1}{2}$ cwt.; it would provide him with 7 lb. of starch equivalent for maintenance, leaving just over 6 lb. to make 2 lb. of live weight increase. It also supplies a sufficiency of digestible protein. It might be modified in a variety of ways without impairing its efficiency. For instance, 1 or perhaps even 2 lb. of the maize might be replaced by 12 or 24 lb. of mangolds. The 2 lb. of linseed cake might be replaced by 1 lb.

of decorticated cotton, soya bean or decorticated ground nut cake, together with an extra pound of maize, or some of the maize might be replaced by barley at the rate of 8 lb. of barley or 7 lb. of maize.

Such alterations, however, are all within the principle of increasing the concentrated food as fattening advances, so that the animals may be able to consume enough starch equivalent to maintain their rate of live weight increase. This is the method adopted by those winter beef producers who aim at turning out heavy, very fat carcasses. In most cases, however, the rations used for this purpose differ from the above in one important point, namely, the use of oil seed cakes instead of maize. A typical ration of this kind is worked out below:—

RATION III.

	Dry Matter	Starch Equiv.	Dig. Protein
	lb.	lb.	lb.
10 lb. barley straw, containing . . .	8.6	2.0	.08
00 lb. mangolds „ . . .	13.0	7.0	.70
4 lb. cotton cake „ . . .	3.5	1.6	.62
4 lb. linseed cake „ . . .	3.5	3.0	1.01
	28.6	13.6	2.41

This is rather a more bulky ration than the maize ration, or neither linseed cake nor cotton cake are really as concentrated as maize. Only the greedier cattle would eat the whole of it; the rest would probably leave some of the straw. It contains plenty of starch equivalent to make 2 lb. per day live weight increase. The real difference, however, is that it supplies nearly a pound per day more digestible protein than a bullock requires. This will, of course, enrich the dung, but it is very doubtful if the extra cost of the cake is on the average 4 years recovered in the value of increased crops. If this is so, the former ration, including maize or some other cereal would be more economical. The use of so much concentrated food in beef production is, however, only likely to be profitable in cases where there is a certainty of a good market for very fat, heavy carcasses, or where such carcasses are required for exhibition, advertisement, or other special purposes.

The difficulty of maintaining a high rate of live weight increase becomes still greater as the animals approach the really fat condition. At this stage the live weight increase consists almost entirely of fat, and according to Armsby's estimate, 1 lb. of such increase requires for its production $3\frac{1}{2}$ lb. of starch equivalent. The maintenance ration of a 14-cwt. bullock must

supply 8 lb. per day of starch equivalent. If the animal is really fat he will require $7\frac{1}{2}$ lb. of starch equivalent to make 2 lb. of live weight increase, making a total requirement of $15\frac{1}{2}$ lb. of starch equivalent per day. Such an animal will not eat more than at most 30 lb. of dry matter per day. The dry matter of his ration must therefore contain just over 50 per cent. of starch equivalent if he is to be able to take in his full requirement of $15\frac{1}{2}$ lb. Barley straw contains 20 lb. of starch equivalent in 100 lb. which contains 86 lb. of dry matter. Its dry matter therefore contains only 23 per cent. of starch equivalent. Evidently it must form only a very small proportion of the ration, and even this must be balanced by nearly an equal weight of some very concentrated food such as maize. The following ration fulfils the necessary conditions:—

RATION IV.

	Dry Matter	Starch Equiv.	Dig. Proteins
	lb.	lb.	lb.
12 lb. barley straw, containing . . .	10.3	2.4	.10
80 lb. mangolds „ . . .	10.4	5.6	.56
9 lb. maize „ . . .	8.0	7.3	.64
1 lb. linseed cake „ . . .	.9	.7	.25
	29.6	16.0	1.55

Such a ration containing 10 lb. of concentrated food per day would not be economical. Its use would only be justified in cases where there was some very special reason for desiring very heavy carcasses of excessive fatness, *e.g.* for one of the Christmas exhibitions. Rations containing as much concentrated food as frequently used in such cases, but the usual custom is to include much more highly nitrogenous cake than is included in the ration given above. This is not advisable even in preparing animals for exhibition, for no cake contains as much starch equivalent in as little bulk as maize does.

The above instances all refer to winter beef production where straw and roots form the basis of the ration. It is possible to apply the same method of reasoning to the fattening of cattle on grass. In doing so there are two difficulties to be overcome. In the first place, there are no reliable direct measurements of the amount of grass which a bullock at pasture eats in a day; and secondly, there are no reliable analyses of grass as eaten by cattle at pasture. Approximate solutions can, however, be found for both these difficulties. There is no reason to suppose that the amount of dry matter eaten by a bullock at pasture differs materially from the amount he will eat in the winter

when fed on roots, straw and cake. This latter amount is well known, and may be stated as follows:—

Weight of Bullock	Dry matter eaten per day
8 cwt.	20½ lb.
9 "	22 "
10 "	23½ "
11 "	25 "
12 "	26 "
13 "	27 "
14 "	28 "
15 "	29 "

There is no reason to doubt that bullocks of similar weight at pasture will eat grass containing similar weights of dry matter.

Analyses and digestibility determinations of grass cut for hay at varying dates show that the younger the grass the higher the proportion of digestible nutrients. Now on a well-managed pasture, the animals eat the grass when it is quite young, and it is probable that in this condition its dry matter contains something like 10 per cent. of digestible protein and 50 per cent. of starch equivalent. A bullock weighing 11 cwt. would eat per day 25 lb. of the dry matter of such grass, which would contain 2.5 lb. of digestible protein and 12.5 lb. of starch equivalent. Subtracting the maintenance ration of 7 lb. of starch equivalent, there remains 5.5 lb. for the production of live weight increase. If the animal is in store condition, he can make 1 lb. of live weight increase from 2½ lb. of starch equivalent, at which rate 5.5 lb. would suffice for the production of 2 lb. live weight increase per day, and still leave ½ lb. of starch equivalent to provide for the muscular work of walking about in search of food. As the season advances the animals will increase in weight and fitness, and at the same time the grass, even if well grazed, will fall off in quality. By the time the animals weigh 13 cwt. their maintenance requirements will have risen to 8 lb. of starch equivalent per head per day, and they will have reached a stage of fitness at which 1 lb. of live weight increase requires at least 3 lb. of starch equivalent. The dry matter of the grass at this time will probably contain not more than 40 per cent. of starch equivalent.

The animals weighing 13 cwt. will eat 27 lb. of dry matter of grass per day, which will supply 10.8 lb. of starch equivalent. Of this, 8 lb. will be required for maintenance, leaving only 2.8 lb. for production. Some of this—say 8 lb.—will be used up in walking about after food, and there will only be about 1 lb. left to make live weight increase. The rate of increase will therefore fall to something between ½ and ¾ lb. per day. The animals will by this time be fat enough to kill. If it is desired to make them still fatter, they should be given a small ration of concentrated food. Even at this time of year pasture grass will contain at least 7 per cent. of digestible protein in its dry matter. The daily consumption of a 13-cwt. bullock

will therefore contain very nearly 2 lb. of digestible protein, which is well above the necessary requirement. The concentrated food required to supplement the grass should be something rich in starch equivalent and poor in protein—some kind of cereal, for instance, and not an oil cake rich in protein.

The pasture described above is good pasture. The difference between good pasture and second-class pasture is two-fold. In second-class pasture the herbage is less nutritious, its dry matter containing, say, 40 per cent. of starch equivalent, and there are fewer blades per square inch, so that animals have to walk further in order to find food enough to fill themselves, and the muscular work required for this walking uses up a considerable proportion of the starch equivalent which would otherwise have served to produce live weight increase. Thus, a bullock weighing 11 cwt. requires for maintenance 7 lb. of starch equivalent. The search for food on a second-class pasture may use up a further 2 lb. Such a bullock will eat 25 lb. of dry matter which, if the pasture is second class, will contain only 10 lb. of starch equivalent. Only 1 lb. of starch equivalent will therefore remain for production, and this will only produce about $\frac{1}{4}$ lb. of live weight increase even if the animal is in store condition. Such pasture will evidently only suffice to maintain growing stores and will produce very little fattening. Its herbage will supply a sufficiency of protein; but to produce fattening it must be supplemented by concentrated food, cereals being more suitable than oil cakes.

It will be noticed that the above discussion has been confined to the fattening of adult cattle. This has been done advisedly, because there is no really reliable information as to the maintenance requirements of young cattle. Practically all the measurements of maintenance requirements of cattle have been carried out on animals weighing about 1,000 lb., and the only figures available for the maintenance requirements of young cattle have been calculated by the surface law from these measurements. Measurements recently carried out at Cambridge of the maintenance requirements of the pig at varying ages indicate that a pig weighing about 70 lb. requires for maintenance nearly twice as much food as the amount calculated by the surface law from measurements made on an adult pig. There is no reason to doubt that a similar state of affairs exists in the case of cattle and other animals. Direct measurements of the maintenance requirements of young animals of all kinds are therefore urgently required, and, until these measurements have been made, it is impossible to work out rations for young stock on a really scientific basis.

T. B. WOOD.

School of Agriculture,
Cambridge.

THE ECONOMICAL ADJUSTMENT OF AIR SPACE IN COW-SHEDS.

THE improvement of existing cow-houses, or the building of new, to qualify for registration for the production and sale of milk, in accordance with the "Milk and Dairies (Amendment) Act, 1922" and "The Milk (Special Designations) Order, 1923," needs careful forethought and planning to avoid unnecessary outlay in meeting the requirements of the Local Authorities, in respect to the volume of air space to be provided. The amount of cubic space supplied, and the way in which it is utilised, will have a marked bearing not only upon the ultimate efficiency, but also upon the actual cost of the cow-house improved or built, and the profit derived from it.

Before going into details a short review of the requirements of the Acts affecting the construction of byres, and the resulting regulations of the Local Authorities, will probably be useful. Briefly, these are the same as under the 1885 Act, viz.:

For buildings in which cows are to be kept continuously, 800 cubic feet per cow is specified, but for cow-sheds from which the cows are to be turned out to graze during a portion of the year, and at other times turned out for at least a portion of each day, no definite figure is stipulated. It is, however, laid down that all the buildings must comply to the "reasonable satisfaction of the Local Authority, for the lighting, and the ventilation, including air space and the cleansing, drainage and water supply." It is further stated that the building cannot be used as a cow-house until these requirements are complied with.

In the regulations of the Local Authorities it will be found that the 1885 Act is closely followed. The 800 cubic feet is insisted on for the byres in which cows are to be housed continually, though for the other class from which the cows are turned out regularly, the regulations vary under different authorities. Some literally follow the wording of the 1885 Act, and do not specify a definite figure, whereas other authorities are more precise and where a minimum is specified this is usually 600 cubic feet per cow.

From the foregoing it will be seen that it is very necessary to be fully acquainted with the requirements of the Acts, and also with the views and regulations of the Local Authorities, before altering or building. This is especially the case when considering the remodelling of old buildings, because there is considerable diversity in the amount of cubic space that will be accepted by the Local Authorities in the adaptation of these

to meet the requirements of the Act. In some areas a much lower amount is approved than in others, although all are for buildings to be used for the same purpose. This entails no little hardship, as will be understood when it is realised that in practice it means that the cost of providing the necessary accommodation for registration in one district may be from £5 and upwards per cow more than in another, entirely owing to the variation in the amount of cubic space demanded. This disadvantage is aggravated at the present time by the low profit yield on farming, and the high prices of building.

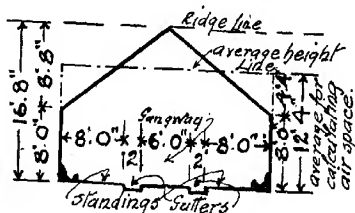
In fairness to the farming industry as a whole, a more uniform standard should be adhered to throughout the country. The question which at once arises is what would be a reasonable uniform standard, and this raises the further question, is the existing method of gauging the probable fitness of a cow-house, by the number of cubic feet per cow that it would provide, really satisfactory? The weight of expert evidence during the last twenty years and more, is strongly against it. It is certain that the regulations could be fully met by a very badly planned and most unsatisfactory byre.

There appears to be much doubt in the minds of many landowners and farmers, as to how the amount of cubic space per cow is arrived at, and the method of measuring it. To help those who are not familiar with the subject an outline plan (Fig. 1), and a cross section (Fig. 2), of a simple double cow-shed for 24 cows, two to a stall, is given herewith. Two isometric projections (Figs. 3 and 4), are also given showing graphically the total cubic space, and the proportion allotted to each cow. It is worth noting that a double shed with a door at one, or both ends, gives the greatest housing accommodation. A door at the side would do away with the space for two cows and thus considerably reduce the milk yield from the house, besides increasing the cost of the building per cow provided for. A single cow-house would need more floor space per cow, to allow of a wide enough gangway for convenient working.

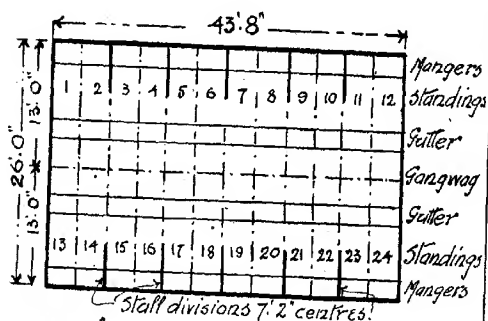
From the diagrams it will be seen that with any increase in the height of the building, a considerable addition, would at once be made to the cubic contents, without in any way adding to the working efficiency or the floor accommodation. The shed provides 1,135½ square feet of floor surface, equal say, to 47 square feet for each of the 24 cows. Taking the internal height from the floor level to the top of the wall at 8 ft.—a generous allowance for a cow-house open to the underside of the ridge—and the pitch, or rise, of the roof a one-third of the span, an average height is given of 12 ft. 4 in. (see Section Fig. 2) or say 12 ft. as some by-laws do not allow

Note. The dimensions figured below are for the housing of the largest sized cows.

Fig. 2.



Single line cross section through the centre of the Cow-house, showing the internal height to the underside of roof and the average height line for calculating the cubic air capacity.



Single line plan, showing the internal size of a Cow-house for 24 cows, with two cows to a stall. The dotted lines indicate proportion of floor space, including the gangway, reckoned for each cow.

Fig. 1.

M. F. V. Gossop.
1914.

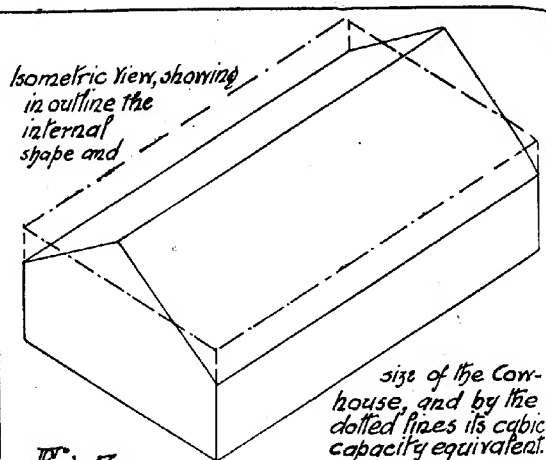


Fig. 3.

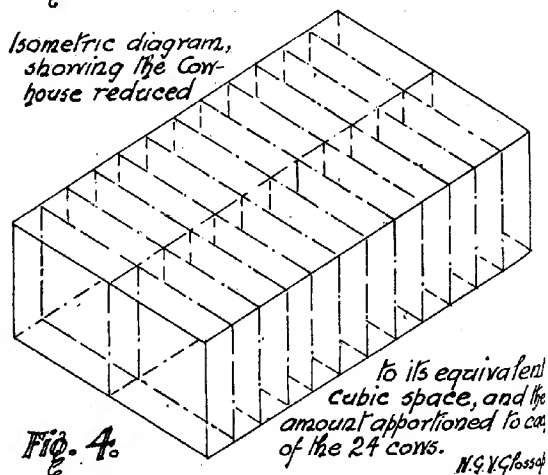


Fig. 4.

N. S. V. Glossop

any height above 16 ft. from the floor level to be reckoned in. Multiplying this height, 12 ft., by the superficial floor area, 1,135½ square feet, gives a total cubic air space of 13,624 cubic feet; dividing this by 24, the number of cows, there is 567½ cubic feet for each cow. This represents an ample allowance of air space for the largest cow.

It follows that to house cows of a smaller breed, reductions could be made in the platforms or standings, and corresponding reductions in the cubic space. It also follows that variations in the width of the gangways, gutters and mangers, would cause increases, or decreases. The addition of feeding passages would add materially to the floor area and cubic space. These latter are sometimes planned for low buildings to arrive at the full cubic capacity required.

With the replanning of old buildings the cubic space requirements need moderating, otherwise the present cow accommodation would have to be very much reduced. To restrict the number too rigidly would constitute a formidable obstacle in the way of improvements at a large number of farmsteads as the farmer would be faced with the alternative of either seriously lessening the number of cows kept and the consequent milk output, or of undertaking the provision of additional sheds involving increased rent or capital cost.

Frequently in the building, or the adaptation, of cow-sheds, insufficient skill and thought are employed in scheming out the best possible arrangement, and in consequence money is wasted in carrying out crudely-planned buildings, which when built remain a constant source of disappointment and dissatisfaction. To design a well-arranged cow-shed the first consideration should be given to the planning of the floor area to the greatest advantage for the comfortable and sanitary housing of the cows, and for the efficient working of the shed with the least labour. At the same time very careful attention is needed to ensure that the most profitable return upon the cost of the shed can be obtained by arranging it to house the fullest complement of cows.

In all buildings for housing live-stock it is absolutely essential that there should be thorough ventilation and ample light, if the highest standard of health is to be maintained. It cannot be too strongly emphasised that pure air and light are vital factors to health and cleanliness. Unfortunately a great fear of fresh air and sunlight in buildings still exists in many minds. The long-established preference for a high temperature in the cow-house has prejudiced opinion against the free admission of fresh air. Want of ventilation results in a foul atmosphere, damp, reeking byres, and enfeebled stock. Effective ventilation gives a more equitable temperature under extreme conditions,

and prevents the accumulation and condensation of the moisture given off from the bodies and breath of the animals. Old buildings can be much improved by attention to the lighting and ventilation. Experimental work in this country has demonstrated these facts, and it has also been clearly proved that mere space does not compensate for the lack of ventilation. On the contrary, it has been shown that excess of space is unnecessary and wasteful. This has been fully confirmed by the recent investigations of the body of experts specially appointed to fully consider the ventilation of cow-sheds in the United States of America. The full results are not yet available, but it has been conclusively shown that large sheds add considerably to the difficulties of thorough ventilation, and in addition have the very serious drawback of making it impossible to maintain the temperature in the building, by the warmth given off from the cows, at the standard needed to prevent them being chilled during severe weather.

The questions of cubic space and ventilation are bound together in such a way that they must be considered together. The Public Authorities originally requested and insisted upon a definite cubic space with the sole object of enforcing that enough air should be supplied to keep stock in good health. It has been proved since, that mere space does not fulfil this, and that less room evenly ventilated, is much more effective in keeping the air pure and healthy, and arrives at the same result at a less cost. The suggestion which arises from these considerations is that the time has now come when there should be more insistence on thorough ventilation, and less rigidity as to the cubic air space required to be provided in cow-sheds. The matter is one which calls for further careful investigation, from a practical stand-point, aimed at determining how to provide efficient ventilation at minimum cost. An adequate system must be reliable under varying atmospheric conditions; automatic in action, or nearly so; adaptable to existing as well as to new buildings; inexpensive. It should not be impossible to satisfy these conditions, and when the problem has been solved a material reduction in the cost of the provision of house-room for the dairy cow—a very heavy item on the modern dairy farm—should result.

W. G. V. GLOSSOP.

South Eastern Agricultural College,
Wye, Kent.

LIGHT HORSE BREEDING.

It is a fact which hardly admits of doubt that the supply of light horses has been for many years past on the down-grade, and that at the present time there is not much encouragement to breed what, for want of a better expression, may be called the general utility horse. The decline in numbers is, of course, due to the enormous increase in motor traction, and this increase is likely to continue in the future. When the Great War began in 1914 it was very quickly discovered that we had nothing like a sufficient supply of horses in this country to fulfil the needs of the Army, and almost immediately we started the importation of Canadian and American horses (at first), while as the war progressed, we bought horses—and mules—from New Zealand, Australia, South America, South Africa, India, the Argentine, and also from Spain and Portugal. Many horses and very many mules were sent directly to the East—to Palestine, Egypt, Mesopotamia and so forth—while to this country came the Canadians, and enormous supplies from North and South America. And here the question arises as to why the horse supply in the countries which have been mentioned should have been, nine years ago, so much better than it was in the United Kingdom at the same time. This question is not easily answered, but it may be mentioned that in all the foreign countries from which we drew supplies there are many remote mountainous districts in which locomotion by means of horses is still a necessity of every-day life. Cowboys and ranchers all over the world must ride at their work, and though motors are in greater use every day there is still a good deal of going to and fro in which the horse holds its own. But ours is a small country from a physical point of view, and England itself is on the whole very flat, except for the line of hills which extends from the Scottish border through Yorkshire, Lancashire, the Peak district to the Cotswolds and Mendips, and further high ranges in West Somerset, Devon and Cornwall. Moreover, in no other country in the world are there so many roads and by-lanes, while what mountains we have, in Scotland, Wales and the Lake district, have very little population, and no agriculture or industrialism which lies higher than 1,200 ft. above sea level. It is, then, the case that motors can travel anywhere and everywhere where there are roads and lanes, which means that in thousands of instances they have replaced horses, both for riding, driving, and transport.

Some five and twenty years ago carriages were in daily use by all who were in a position to keep them. Private carriages could be counted by the hundred in the West End of London

every afternoon, and of four-wheeled- and hansom-cabs there were probably nearly as many as there are now taxi-cabs in the London streets. Carts and wagons of every description, drawn by horses, did all the transport work of London and all the towns, both large and small, and except for a few steam ploughs, &c., all the agricultural work all over the country. When railways first came it was predicted that there would be a great decline in horse breeding, but this was not the case, and as a matter of fact the demand for horses grew with the increase of population, and it is probable that more horses were bred in this country some five and twenty years ago than at any former period. To turn again for a moment to the horses required for the war, it is the case that when hostilities were declared our army possessed about 25,000 horses, but there were in addition all over the country a considerable number which had been registered, or earmarked for service when called upon, and within a fortnight of the outbreak of hostilities we had nearly 200,000. Importation began almost immediately, while at the same time the country was scoured for horses which had not been among the earmarked lot. All the hunts were called upon, and yielded up horses which made the finest cavalry mounts the world has ever known. Farmers' horses were taken in great numbers to be used as gun horses, and even the best of the tradesmen's nags were utilised, so that in a few months the country was almost drained of light horses, only the very young, the very old, and the very moderate ones being left. And still importation was being enormously increased, and the overseas supply was not exhausted when the Armistice was signed. An inspection of the bigger and more important Remount Depots in the winter of 1918-19 was a revelation of the numbers and quality of the horses that had been procured from foreign countries. But the best were all-British, though only a small contingent, for the war was now more than four years old, and a considerable number of horses which had been in foalhood or colthood four years before were now sufficiently matured to take their place in that part of the army for which they were most fitted. And it must be remembered that although we were obliged to import great numbers of horses, buyers were still at work in this country, and by this time many of these buyers knew where all the good young ones were, and were ready to buy them as soon as they were old enough for strong work. At one camp some thirty to forty chestnuts of hunter type were paraded, and a finer lot of young embryo hunters were rarely seen out of a show. The war now being over, these horses were sold at Tattersalls, and many of them brought very high figures. It need hardly be said that, at the date mentioned, the Remount Depots were in full

working order, but during the spring of 1919 horses and mules were sold, great numbers by auction, and a sum of something like thirteen or fourteen millions was realised by the sales. Of the mass of horses seen during these visits a minority had been bred in the United Kingdom, and a great number of these had been set aside for cavalry remounts.

There is no getting away from the fact that nine out of every ten "light" horses in this country are of no fixed breed, and these are the horses one sees in harness, or under the saddle, either used as hacks or in the hunting fields. There are, it need hardly be said, certain fixed breeds, viz. the thoroughbred, the Stud Book hackney, the Stud Book Polo pony, the Stud Book Cleveland Bay and Yorkshire Coach horse (these two breeds having been lately combined), and several breeds of ponies which are in the Stud Books of the particular breed to which they belong, and last but not least, Stud Book hunters, which, however, are a very small proportion of the horses which are regularly used as hunters. To take the thoroughbred first, we find that the breed is, broadly speaking, two hundred years old, which means that the pedigrees of all the animals which are entered in the General Stud Book can be traced back to certain sires and certain mares of some two hundred years ago, and which gradually formed the present race of thoroughbreds. In the case of the sires it is a fact that every thoroughbred goes back to one of three horses, two of which were imported early in the eighteenth century and one a little later. Though these three only represented less than one-fiftieth of the Eastern sires which were brought to this country in the seventeenth and eighteenth centuries, they alone have lived in tail male, while the others founded no male line which lived more than a generation or two. To explain this a little more fully it may be stated that the strongest line is that of the *Darley Arabian*, brought to this country in 1705 by a Mr. Darley. About nine-tenths of the winners of races in this country, in any recent year, are in direct tail male from this horse, and to quote recent examples I may name *Papyrus*, who won the Derby this year, and *Tranquil*, who won the One Thousand and St. Leger. The second line comes from the *Byerly Turk*, the date of whose stud life in England is not exactly known, but who was ridden as a charger by Captain Byerly at the Battle of the Boyne. Presumably he was imported about the close of the seventeenth century, and for a time his male line did as well as that of the *Darley Arabian*. Gradually, however, the last-named line went ahead, and the line of the *Byerly Turk* was in a poor way in this country until *The Tetrarch* came on the scene. Since then it has flourished exceedingly, and the most recent upholder of the blood is the equine wonder, *Mumtaz Mahal*, who is probably

the speediest race-horse of the present generation. The third Eastern sire to found a line was the *Godolphin*, a horse about whose country of origin there is a doubt. Some said he was an Arabian, other opinion pronounced him to be a Barb, and now this question will never be settled. He was discovered by one of the "Cokes of Norfolk" in 1728, and there is a story (which needs substantiation) to the effect that he was employed to draw a water-cart in Paris. He founded a line, however, and though it never took a very high place it is fairly prosperous at the present day, and *Captain Cuttle*, and his sire, *Hurry On*, may be quoted as the best two representatives of the line of the *Godolphin* in recent years.

Of the mares to which present-day race-horses can be traced in tail female, race-horses sprung from between forty and fifty mares are still to be found, some of these mares having great numbers of descendants, while others are only represented by very few survivors. There is no need to go into further particulars with regard to the mares, but it must be explained that all the horses which are eligible for the General Stud Book must go back to one of the three sires which have been named, and to one of the mares whose name appears in the earliest volumes of the Stud Book. Even if there is pure descent for eight generations or more, and then a flaw in the pedigree, the horse is ineligible, and to give instances of recent turf celebrities whose names do not appear in the Stud Book, mention may be made of *Irish Elegance*, *The Shogun*, *Glorane*, and the recent Cambridgeshire winner, Lord Coventry's *Verdict*. All the thoroughbreds in the kingdom are, primarily, bred for racing, and a big majority of them are put into training. With their actual racing I have no concern in this article, but I may state that the best win all the great prizes, and are then put to the stud. The second and third best win the handicaps and minor events, and while the mares of this contingent are in nineteen cases out of twenty, put to the stud—like those of the very best class—many of the colts, if not thought good enough to be mated with thoroughbred mares, do excellent service as King's Premium Stallions, and as Country Stallions, being mated with hunter mares, with light mares which have not been actually hunted but who look like making brood mares, and very frequently with ponies. Indeed, it is almost safe to say that four out of every five "light" horses have been sired by a thoroughbred, and this is due to the fact that if we leave out the draught horses—Shires, Clydesdales, and Suffolk Punches—and the Hackney sires which are chiefly mated with Hackney mares, there are very few light-horse sires in the country. There are a few of what are called hunter-bred sires, and in Wales and the Western Midlands a fair number of Welsh Cob sires are to

be found, but all over England the common sires of any district are draught horses and thoroughbreds, and the light mare is generally sent to the thoroughbred.

This brings us to hunter breeding, and it may be stated that though all breeding of horses is to some extent a lottery, there is a far greater element of chance where an animal of pure blood is mated with an animal of mixed descent. This has been proved a hundred times, and there is reason to think that where there are not several generations of similarity the chances of a throw back are far commoner than they are when both sire and dam come of carefully preserved lineage. All thoroughbreds, for example, are not only in-bred, but so greatly in-bred that it is possible, if the pedigree of any horse is taken far enough back, to find the same name occurring something like a hundred times. Now with the chance-bred light horse very often nothing whatever is known as to his breeding. He may have passed through two or three hands, and such particulars as were forthcoming when he left his breeder have been forgotten or lost by some of his subsequent owners. In the case of horses sent from Ireland to be sold as hunters in this country, there was a time, before the war, when very few pedigrees could be relied upon. If all had been correct, such horses as *Ascetic*, *Walmsgate*, and one or two others must have sired five hundred or more foals in a single season, and the result of this sort of indiscretion—to call it by no stronger name—was that buyers chose half-bred horses on their looks and performances, and took no notice of the pedigree, unless indeed they knew they were dealing with an absolutely trustworthy man. And here it may as well be mentioned that a very large number of the best hunters have always been bred in Ireland, and that though there has been a big falling off in the supply for several years, owing to political troubles, there was never an absolute cessation, except perhaps when it was almost impossible to ship horses to this country, unless for army purposes—and at that particular time there was no demand for hunters in England. The war had not been long over, however, before Irish horses began to come in again, and about four years ago I saw a small contingent of good-looking hunters which had recently arrived at an English farm. Now that the internal troubles of the Free State seem to be almost settled, it is more than likely that the hunter trade with Ireland will soon be in full swing again. What is certain is that the average Irish breeder knows his business, and seldom has a young horse for sale which does not show many signs of breeding. Some few are apparently thoroughbred, but there is no great number of these, and even those which appear to be actually of pure blood are probably ineligible for the Stud Book, as there are several strains of

good blood in Ireland where there is a flaw in the pedigree many generations ago. The best of these horses are now entered in Prior's H.B. (Half-Bred) Stud Book, which shows where the pedigrees have been lost, and which is a most useful book both for hunter breeders and the owners of Steeplechase horses which have been bred in Ireland. There are, too, a very small number of thoroughbred hunters in England, but as a rule these are geldings which have been raced under Jockey Club rules, or at all events across-country, but are not good enough to keep in training. A horse may be a first-rate hunter, and yet lack the turn of speed which would enable him to win the best class of steeplechase. The point need not be elaborated, but it may be mentioned that the Cambridgeshire winner, *Christmas Daisy*, carried Captain Forester, the Master of the Quorn, to hounds for many seasons, and that Captain Atkinson, Master of the Morpeth hounds, rode *Knight of Rhodes* as a hunter, and this horse had won the Lancashire Steeplechase with 12 stone 4 lb. in the saddle.

But one swallow does not make a summer, and these thoroughbred hunters are only mentioned as proof of the generally recognised fact that the better bred the horse is the more likely is he to make a good hunter. It is, of course, impossible to find more than an odd thoroughbred in any hunting field, and in provincial hunts horses of pure blood are seldom seen. Not more than about five thousand thoroughbreds are bred each year, and all the mares and all the best horses are sent to the stud. But in all probability nineteen horses out of every twenty in any hunting field have been sired by a thoroughbred horse, and these include all the best hunters in the kingdom. And yet hunter breeding remains not exactly a lottery but an affair into which chance enters very considerably, though those who are breeding on fixed lines, and who in fact arrange their matings with great care, are undoubtedly making progress. Hunter breeding in this country includes the breeding of cavalry remounts, as far as the home supply is concerned, for almost all the horses which are bought by the army for this particular branch of the service have been, almost certainly, bred with a view to the hunting field. The ordinary breeder of light horses does not set out to breed a cavalry horse, because he knows that the price paid by the army buyers will not yield so much profit as could be procured from the buyer of embryo hunters. But it is only a certain proportion of horses bred on hunter lines that can command big money, and any horse who cannot bring a fair profit is left on his owner's hands, or must be sold at a lower figure. The army buyer then has his chance, but it must not be understood that because the army buyer does not buy all the very best hunters those which he buys are bad

ones, for this is not the case. Horses vary greatly both as to size, make and shape, action, and so forth, and there are a big number of animals bred every year which are sound, useful, and capable of any amount of work, and yet not the possessors of the fine qualities of the horses which bring big prices as hunters. Experiences gained in the late war suggest that horses of the "light draught" stamp are required in greater numbers than those of the hunter type, and that for cavalry the English or Irish hunter is the best horse in the world—in spite of the fact that the average hunter is a cross-bred animal belonging to no particular breed. But slowly and surely a breed of hunters is being formed, and this breed it is which deserves much more attention than it now receives.

Reference, as will be guessed, is made to the Stud Book hunter, which is very gradually gaining ground under the auspices of the Hunters' Improvement and National Light Horse Breeding Society. The society in question was established nearly forty years ago, with the idea of improving the breed, and promoting the breeding of hunters and other riding and driving horses, and horses used for military purposes. In these days "driving," by which is meant carriage horses, hardly enter into the society's scheme for two reasons, one being that the motor has almost caused the ordinary carriage horse to be no longer required, and the second the fact that under the auspices of the Hackney Horse Society very superior carriage horses are bred. The society first referred to, and which may be more briefly described as the Hunters' Improvement Society, has in the past, and is still, doing good work; indeed, it has made a big advance in post-war years, but its trouble is that it is still neither big enough nor comprehensive enough. Horses which are practically thoroughbred, but which are disqualified for the General Stud Book because of some flaw in their pedigree many generations ago, lose value from the breeding point of view, more especially the entire colts, but with regard to hunters there is no penalty incurred by their absence from the Hunter Stud Book, and though a hunter mare when sent to the stud may have a slightly increased value because she is in the Book, the working hunter is worth not a penny more nor a penny less for being a Stud Book hunter.

That the Hunters' Society is making good progress is obvious to every one who has had a fairly lengthy experience, not only of horse shows, but of hunting fields of fair size, for the fact is that an all-round improved standard is to be seen everywhere. At the old series of hunter shows, which used to be held at Islington in May or June, the unequal quality of the classes was noteworthy, with horses of half a dozen different types, and many of them not only of plain conformation, but obviously

very short of quality. Even then, however, the type that wins to-day had been evolved, to a considerable extent—the horse with length and scope, allied to good limbs, and a great deal of quality. The best hunters of the present day can all gallop fast, and can of course jump well, but a couple of generations ago the clever slow horse, often too short-coupled and very short of quality, would please many of the judges, and would beat horses which were bigger and probably faster, but were at the same time higher on the leg and more up in the air. The old-fashioned short-legged sort may be the very best hunter for some countries, more particularly those where there is a good deal of plough land and extensive woodland, or where there are hills so steep that horses must go slowly either up or down, but for the grass countries, and all good vale land where grass and plough alternate, there must be pace, and horses must be able to spread themselves as they jump. The short-legged sort is, as a rule, good at timber, stone walls, and very often at banks, but when a strong hedge has a big ditch on one or both sides the horse who spreads himself in his jump is better than the up-and-down jumper. But if the difference in type and the presence of the moderate-looking horse (some plain horses are at times good hunters) was to be seen at the horse shows of forty years ago, it was much more evident in the average hunting field at the same date. There were to be seen certain men who were always well mounted, and as a general rule horses ridden by a hunt staff would pass muster, but even this was not always the case, and both huntsmen and whippers have sometimes been mounted on almost worn-out screws, which were very quickly beaten when hounds ran at anything like top speed. And the less particular of any provincial field rode horses of every make and shape, some not the least like hunters, while others, though showing some signs of breeding, were too light and weedy for the weights they were asked to carry. Many, too, were general utility horses, hunted on one day of the week, and driven on all the others. Men who rode strong cobs generally had a much better ride than those who were mounted on what was really a bad hunter, and one can recall great numbers of these bad hunters, many of whom had sufficient size and big limbs, and were not exactly ill-looking, but regular flat-catchers when they were asked to go through a run with hounds.

Now the pattern at the shows is much more uniform, and very moderate horses are the exception in the hunting field. The chief factors in the improvement of hunters are the granting of the King's Premiums to travelling stallions, and the efforts of the Hunters' Improvement Society, which are chiefly visible in the care and attention which is paid to mares and their mating.

It is, indeed, gradually becoming a fact that the best sort of hunters show, practically, the same qualities and are much more alike than they were some years ago. But it is individual effort on the part of those who are determined to breed good hunters which has aided the efforts of the society, and caused the King's Premium horses to be so successful. When the Premiums were first established in the 'eighties of last century, the writer was living close to where one of the very first of these stallions was located, and in a few years time it made a distinct mark on the local breed of light horses. And on the whole the class of mares which visited him, was very poor indeed. Yet he at once began to sire some exceptionally good hunters, though, as was only natural when the mares were considered, some of his get were of little value. The stallion in question had not been raced, and had in fact been bought at the Doncaster sales with a view to serving hunter mares. He only cost £25, because he was of unfashionable blood—being by a horse named *Quits*, who used to win a lot of hunter flat races for the late Duke of Hamilton, and who was by the Alexandra Plate winner, *Restitution*, by *King Tom*—but he was bought by a consummate judge, on account of his strong build, great bone, and fine quality. All the best he got were first-rate stayers, for whom no day with hounds was too long, and though he was only a little horse in the matter of inches he sired much bigger animals even out of small mares. One of his get did 256 full days' hunting, carrying a man who rode 15 stone, and at the end of one great hunt, when only three men were with hounds for the last half-hour, two of them were on horses sired by the stallion in question, whose name was *Even*.

At the present time sixty King's Premiums are given every year, the scheme being nominally under the management of the Ministry of Agriculture and Fisheries, who, however, act on behalf of the War Office. Immediately after the war it looked for some time as if the whole scheme would collapse, but its value was as well known and approved by the War Office as it was by breeders of hunters up and down the kingdom, and the Hunters' Improvement Society worked very hard in their endeavour to bring about a continuation. This was not secured until after a great deal of negotiation, but at length the Government appeared to understand the Hunters' Improvement Society's point of view, and, thanks in a great measure to the efforts of Lord Mildmay of Flete acting on behalf of the society, the necessary sanction was given. The sixty horses selected at each stallion show in the early spring travel through England and Wales, and it is reckoned that their average earnings amount to £360 apiece. And in addition to these King's Premiums, super-premiums of £100 each are given to the twelve

horses which the judges decide to be the best in the show. Every stallion must be licensed by the Ministry, under the Horse Breeding Act of 1918, before it can be entered for the show, and this is, of course, an admirable precaution, because it not only ensures that no premiums are given to unsound horses, but also protects the breeder. In old days there were probably as many unsound travelling Country stallions as there were sound ones, and one of them comes to mind—bought out of a selling plate who was unsound in several ways, and yet was a most prolific stallion. He flooded the country-side in which he was located with horses which had inherited all sorts of defects, and still owners of light horses patronised him simply because he was the only thoroughbred within reach. Now the examination which an aspirant to King's Premium honours has to pass is a severe one, for cataract, roaring, whistling, ring-bone, sidebone, bone spavin, navicular, shivering, and even stringhalt all constitute unsoundness, and the horse eligible for a premium must be absolutely free from these. It is now an admitted fact that the King's Premiums are of great value to the country, and all who take any interest in light horses must recognise and approve what has been, and is being done, by the Hunters' Improvement Society, but, as has been suggested all through this paper, there are far more light horses which have no pedigree, or whose pedigree is lost or forgotten (when they have changed hands two or three times), than there are horses with a pedigree of pure blood on the male side, and with two or three crosses of blood on the dam's side, and recent evidence suggests that as the improvement which is gradually but surely taking place is making a big mark in the hunting field, the policy of those who are breeding on the lines suggested by the Hunters' Improvement Society should be followed up.

It is seldom worth while to breed from very old or almost worn-out mares, though at times an old hunter mare may breed a good horse. Thoroughbred mares are put to the stud when still young, but light-horse mares of no particular breed are for the most part only mated when well up in years. At times a farmer will breed from a young mare for which he has no great amount of work, and hunter mares will occasionally be bred from when still quite young, because an accident or lameness has put an end to a hunting career. But in a big majority of cases, mares, if really good hunters and sound, are kept for hunting until they are long past their prime, and then mated. It perhaps not infrequently happens that these old mares will breed a useful horse or two, but many of them are failures at the stud, because they have been too old when they began stud life. If mares which had proved themselves to be good hunters were bred from after three or four seasons of hunting at most

there would be a much greater chance of success than there would be if the mares were worked until they were several years older. Some of the most successful of hunter breeders have young mares in their paddocks, and Irish farmers breed great numbers of excellent hunters which are to be bought in this country from young mares. The trouble is that any hunter, either mare or gelding, who goes on, from year to year, maintaining its form in the hunting field, is generally such a favourite, and carries his owner so well, that there is great disinclination to part with him or her. The chief reason for suggesting that young mares should be bred from is that in several districts there has been a difficulty in recent years of finding a full complement of mares for the King's Premium stallions.

There is reason to believe that the much-talked-about shortage of good-class hunter mares is a fact, and the supply would be improved if more attention was paid by hunting people to the fate of the mares they ride. Scores of hunting folk get rid of their horses at the end of the season, selling both mares and geldings, and apparently not caring what becomes of the former. If only owners of studs who are unable, or not in a position, to keep brood mares would try to find them a home where they could be bred from, there would surely be an increase in the number of mares suitable for mating with King's Premium stallions. But as things are, the catalogues of hunter sales often show nearly as many mares as geldings, and it is good odds that hunter mares which frequently change hands gradually descend the equine ladder and finally are worked in harness until they can work no longer. Hunter breeders, or perhaps, rather, would-be breeders of hunters, should bear in mind that good hunters can frequently be bred from mares which have never seen the hunting field. Many good hunters have been bred whose dams were what used to be called carriage horses before the days of motor-cars: I do not mean the pedigree hackney of the present day, but the nondescript—as far as pedigree goes—animal which was driven five and twenty years ago by ninety-nine out of every hundred owners of carriages. There were probably as many mares as geldings among these carriage horses, and all were emphatically "light" horses, and not of the cart-horse type. There are those who advocate the cross of the thoroughbred with the light cart-mare, but the policy cannot be advocated. As a general rule it takes at least four or five generations to get rid of the hairy-heeled characteristics, and even if the result of a first cross is a hunter to look at, he is soon found out when hounds run really fast. A horse by a thoroughbred out of a cart-mare who filled the eye as a hunter, and which, with regard to conformation and general appearance, favoured his sire entirely, had considerable

success in the show ring, and was actually first in the class for weight-carrying hunters at the Royal many years ago. In the following spring his owner thought his show horse could win a point-to-point, and he was started for one of these races. He was, however, very quickly tailed off, and when half the four miles had been covered he was nearly a quarter of a mile behind. Yet on any day on which hounds never ran hard, or kept to the woodlands, this horse was a good hunter, and a clever jumper of the up-and-down variety. If there is cart-horse blood close up in a hunter he can seldom gallop fast, or stay, while as a rule he is unable to spread himself when a wide jump is met with. Nor is the thoroughbred and hackney cross to be recommended, chiefly because the modern hackney is essentially a harness horse, and generally has a straight shoulder, a weak middle, and two big ends. Then, too, the action of the hackney is not what is desired in a riding horse. Most hackneys have so much action that the comfort of the rider is interfered with, and they are so bred at the present day that the trot rather than the gallop seems to be their natural pace. But hackneys are often capital jumpers, and every now and then a fine performer of their breed is seen at the shows. The chestnut, *Rufus*, who won scores of jumping prizes at the London and other shows some twelve to fifteen years ago, will be remembered, and at the last Olympia Show one very good performer was said to be a pure hackney.

Pony blood as a foundation for light horse breeding is excellent, but as in the case of the cart-horse it must take two or three generations to get the necessary size, if the foundation is to be taken from one of the native breeds, and not from the cob, polo pony, or horse in miniature, who has probably had genuine pony ancestors. The New Forest, Exmoor, and the Dartmoor ponies are all native breeds of small size, but among each of the three breeds capital riding ponies can be found, which are often up to much more weight than their appearance suggests, and in a majority of cases well endowed with stamina. Within the last four years the writer has frequently ridden an old hunter who is by a thoroughbred out of a Dartmoor pony, but this horse stands almost sixteen hands, is strongly made, and in appearance almost a thoroughbred. It is not known whether his dam was a small or a big pony, but the hunter has gone through upwards of ten seasons in a rough hilly country, is still very fast, and sure-footed among hills. In the New Forest the native breed of ponies made admirable boys' hunters, and it would be better to mate the bigger mares of the breed with a big thoroughbred than try any experiment with mares of coarse blood.

The Welsh cob is at the present day a useful and very popular

animal in his own country and elsewhere, but like other varieties of the light horse there is not the demand for him there once was, owing to so many tradesmen having taken to the Ford car. Among the Welsh mountain districts he is invaluable, for an enormous number of the hill farms have no road to them which a motor-car can travel, even if the farmer was inclined to buy one. The Welsh cob and the smaller Welsh pony are extraordinarily sure-footed, and now a good deal of pains is being taken with the breeding of both, and it is to be hoped that the hackney cross will not be persisted in.

The hackney occupies a curious position, for he was never better as a harness horse than he is just now, when the driving of smart horses is quickly becoming a thing of the past in this country. It is not so, however, in parts of the Continent, and there is a fair demand for hackneys from Italy, and in a lesser degree from France and some of the smaller Powers. Time was when the hackney was a riding horse, but for several generations what may be called extravagant action has been encouraged, and as a result the old-time hackney has become a carriage horse, the very high action being in a majority of cases of the sort which gives the rider a good deal of discomfort. It is claimed that the hackney is the soundest of all the breeds, and that if well treated his life of usefulness is a very long one. Personally I have known of several hackneys working well, and giving a great show, when upwards of twenty years old, and I remember the furore which greeted the famous *Rosador*, when he won the championship at Islington when sixteen years of age. He had won the same honour when a young horse many years before, and had been a great success at the stud, but his action was in no way impaired, and he was about the most perfect modern hackney I ever saw. And it is marvellous how well the Stud Book hackney of high pedigree holds his own, but the fact is that to a great extent the hackney is now a show horse, whose vocation in life is to win prizes, first as a young animal and afterwards in harness. Cross-bred hackneys are often first-rate harness horses too, and I have seen a team of these who could go up and down steep hills at a capital pace, and, in fact, work hilly slopes faster than an ordinary team of nondescript horses, and be quite as fresh at the end of the journey. The hackney pony, or the Wilson pony as he was called when the late Mr. Christopher Wilson first began to establish the breed, is the best possible small harness horse who can travel at twelve miles an hour in a light trap or governess-car—if not too heavy—and there seems to be some demand for him even now, as he appeals strongly to a certain contingent of horse lovers, and is a very showy animal.

Another good stamp of riding horse can be bred by the

mating of the thoroughbred with the Dales pony, who is the biggest of all the native breeds, except perhaps the Highland pony, which has been used for generations to carry the deer which are killed by stalkers, and who, like the Dales pony, is very strongly made. One seldom hears of the Highland pony away from the Highlands, but the late Lord Middleton brought some of the breed to Birdsall, in Yorkshire, and crossed them with thoroughbred sires, and with mares that were nearly thoroughbred, with a fair amount of success. The Dales pony also breeds well to the thoroughbred. Of late years very great improvement has been made in Dales ponies, which now have a section to themselves in the Pony Stud Book, and it is said that some of the best have strains of pure blood in their veins. It is a tradition that the late Mr. John Bowes, of Streatlam, occasionally sent thoroughbred stallions from the Streatlam Stud into Teesdale for the use of the farmers in that district. It is not desired to suggest that the cross of the thoroughbred with the Dales pony is the royal road to hunter breeding, but mention is made of this foundation stock, so that those who read may be able to form an opinion as to the actual resources which the country possesses. There are, also, the Fell ponies in Cumberland and Westmorland, the best of which I believe are to be found on Lord Lonsdale's Lowther Castle estate, and these ponies, too, are of fair size, and very honest workers. Nor must the Cleveland Bay be forgotten, and this breed is very much on the up line at present. The Cleveland Bay is a horse of considerable size, and harness work and the ploughing of light land have always been his strong points. But at times scores of good hunters have been bred from the cross of the Cleveland Bay with the thoroughbred, and in every way this cross has always appealed to the writer as a much sounder method of breeding high-class light horses than by going to the cart-mare with a view to securing extra strength and size. There are those who consider the Cleveland Bay to be an ideal artillery horse, but there are so few of them that the army buyers are obliged to seek in other places for what they want—even after they have secured all the best Clevelands which may be on the market at any given time.

To sum up the position, the breeder of light horses of every description should bear in mind, firstly that whenever mobilisation is necessary two types of horses are instantly required for the troops, one the cavalry remount, and the other the gun horse. If there were no hunting there would soon be, practically, no cavalry remounts in the country, and the fact that a great number of hunters are required every year, and that the best of them bring big money, enables many a breeder—especially the man who only keeps a mare or two on his farm but who under-

stands hunter breeding and knows what he wants—to set about his task, knowing that he may possibly obtain a fairly long price for his horse, and that in any case he is not likely to lose by him unless the young animal meets with an injury. Horses of the hunter type make the best cavalry horses in the world; of that there is no doubt, and it is a lucky thing for the British War Office that so many hunters are bred, for this means that a fairly large supply of the very best sort of remounts is available at any moment. About gun horses the situation is not so clear, and the opinion of a civilian is not worth much. And judging from many conversations with Artillery officers there is considerable division of opinion. Towards the end of the war one heard most of American-bred Percherons, but it must be remembered that by that time the British supply was to a great extent exhausted, that, in fact, there were in this country only the annual output of young light horses which a year or two before had been too young for war service. From this source few were obtainable during the latter part of the war, while the American-Percherons were still to be procured in great numbers. This means that the British gun horses used in the earlier stages of the war had been to some extent forgotten, but there is reason to believe that some of them were excellent, though of no particular breed or type. One gunner officer who was with the troops right through the war reported that the first lot he had to do with in France included horses of every class—horses of the hunter type, horses whose action showed that they had hackney blood in their veins, hairy-heeled light cart-horses, and many of the sort one sees in light vans, viz. horses of fair size and strength, with very few signs of breeding, but *not* hairy-heeled. His strong opinion was that those who showed the most breeding were the best workers.

CHARLES RICHARDSON.

Lands End,
East Molesey.

POULTRY-KEEPING ON THE FARM.

DURING recent years poultry-keeping has received considerable stimulus from the shortage of supplies and the increased demand for eggs induced by the higher standard of living of many classes of society; and the additional attention attracted to it has resulted in considerable modifications of former practice. Many farmers who never regarded their poultry very seriously have found them to be the most profitable branch of farming during the recent decline in prices for the more important products.

If success is to be achieved it can only be by careful study of the subject, by the proper housing, feeding and general management of the stock. Success depends on many things, and not the least on business ability and hard work.

The farmer who would succeed must not let his birds stray all over the place. They must be confined to certain houses and fields just as are the cattle, sheep and other stock. One section of the farm should be devoted to the poultry entirely. This does not mean that all the stock is at all times to be kept in this one section. At certain seasons the orchard, the meadows, the corn fields, and other sections of the farm will be benefited by the poultry being run in them. A most important, almost the most important factor to be considered at the start, is the selection of the land for the poultry. In the first place it must not be too far from the farmhouse, otherwise there will be too much labour in carrying to and fro, which adds both to the time and cost entailed. Then it must not be the most exposed land on the farm, as the keen, cutting winds of early spring would not only retard the development of the early chickens but would also interfere with the egg production of the laying stock. Land for poultry needs to be well drained, birds will not thrive on marshy, boggy land.

THE STOCK.

There are many kinds of fowls. Some breeds are great egg producers, and of little service for anything else; others are most excellent as table birds and of little use in egg production, whilst some come between the two and are known as "general purpose breeds." They are not quite so good as the best table birds so far as their edible qualities are concerned, and they do not equal the best laying breeds in egg production, yet when all their qualities are weighed up they will, in some localities, yield more profit than either of the others. Mixed farmers have many advantages over the poultry-farmer, and those advantages must be considered when the question of breed is being thought out. Should the farm be situated near to a large industrial centre, or a seaport town, egg production, possibly, will pay best, as in such places there is always a ready and steady sale for new-laid eggs. On the other hand, if there is a fashionable seaside resort, or health spa in the near vicinity, it may be wise to cater both for the new-laid egg demand and table birds. In such a district, the table birds will have to be of high quality, and therefore one of the general purpose breeds will hardly be suitable. But a farmer situated near a popular holiday seaside resort would possibly find that one of the general purpose breeds would answer the requirements best.

Another point to be considered is the geographical situation.

If the farm is situated at a high altitude, a general purpose breed would suit best, because such breeds are very hardy. White and Columbian Wyandottes, Rhode Island Reds and Buff and Barred Rocks do well in such localities. These breeds, however, are not highly esteemed if the trade for high-class table poultry is to be considered. For egg production in such a district White Wyandottes from a strain that has had its laying qualities specially developed would answer the purpose best. Farther south, the White Leghorns and Anconas would yield the best results for commercial egg production, but neither are of any use as table birds except for very small spring chickens. The Sussex do well in almost any situation, but best of all on light land. In a district where there is a demand for brown or tinted eggs, the Light Sussex, Rhode Island Reds, or White Wyandottes, and Croad Langshans should fill the bill; these are also fairly good table birds. For table purposes only the Dorking, the whole of the Sussex family, together with White and Buff Orpingtons, have great qualifications, as have crosses with any of these and Indian Game.

It is important not to overstock the land. In America birds are kept far more closely than in this country. In some places as many as 1,000 birds are run on an acre of ground, but the atmospheric conditions are different to those prevailing over here. In Australia, too, birds are kept much more closely than in England, and they run on the same land year in and year out. In our humid atmosphere with its admixture of sunshine and rain such methods would quickly bring the poultry farmer into the Bankruptcy Court. Speaking generally, 200 to 300 laying birds may be run on an acre of ground, but the ground must be divided. If grass, the birds may run on each half in alternate months; if the land be cropped with kale or cabbage, then the stock will spend six months on one half and six months on the other. Grass will carry more birds than arable land, and on the latter there should not be more than 200 to the acre. When birds are overcrowded the egg production is lessened.

Birds should be kept in small lots, say 100 laying pullets to the house. These will do well in a house 20 ft. by 15 ft. or 30 ft. by 10 ft., that is for the light breeds, such as Leghorns and Anconas; for the heavier breeds, such as Rhode Island Reds, Sussex, Langshans and Wyandottes, the house should be 40 ft. by 10 ft. The run attached to such a house should be half an acre divided in two.

Important as is the selection of land and the number of birds to run on it, equally important is the selection of the breeding stock. In purchasing stock for breeding it should ever be remembered that it never pays to buy cheap stock. In

these days when we have many publicly conducted Laying Competitions one can buy stock of the laying breeds, such as White Leghorns, Black Leghorns, White Wyandottes, Anconas, Minorcas, Campines, and of the general purpose breeds, such as Rhode Island Reds, Light and Speckled Sussex, and Cross Langshans with certified pedigrees. It is far better to give three guineas for a cockerel and a couple of guineas each for hens that have been bred from birds with a public record behind them than it is to give half the money for birds which have no such standard recommendation. In the purchase of stock as in other things "the best is the cheapest" in the long run.

A breeding pen of one of the lighter breeds may be made up with a cockerel and eight to ten hens, and of the heavier breeds with a cockerel and seven to nine hens. Speaking generally and guided by experiments I have made, I am inclined to think that we should get better results in our breeding pens by mating even more hens with a cockerel than the number I have given, which are those most usually adopted.

Beginning with two pens of breeding stock, a farmer who decides to improve his poultry could easily hatch 1,000 chickens the first season. Assuming that 600 of these were cockerels, he would have 400 pullets to commence operations with the following season. At the moment it is assumed that the farmer himself or some member of his family will undertake the management of the poultry at the start whilst experience is being gained. The farmer who intends to make poultry one of the money-makers of his farm should have practical knowledge of the work before entering upon poultry-keeping to any great extent. If he has not he is entirely in the hands of his poultry man. It is not necessary that he should do the routine work himself, he can easily have this done by a woman or a lad, but it is essential that he should know how it should be done, and also see that it is done. He should superintend all the feeding, mating, hatching and rearing work, so that when he does bring his plant up to the full extent and engages a professional poultry manager, or manageress (some of the latter are very capable), he will be able to supervise and check their work from his own knowledge gained in the best of all schools—Experience.

GENERAL MANAGEMENT.

Anyone who starts in this way will be far more likely to make a success of poultry-farming than one who, having decided that it is a good thing to make poultry an integral part of the farm stock, straightway goes and engages a poultry manager and staff, erects elaborate houses and runs, and fills them with a lot of very expensive and highly-bred birds. It is much wiser

to start in a small way and build up the stock than it is to make a big plunge all at once. However, when the stock is sufficient to need the services of a manager and staff, or if it is intended to make a big plunge at the outset, the first thing is to secure a really capable manager; such an one may be found by advertising in one or other of the poultry papers. In engaging a manager select one who has had plenty of practical experience and who has been in charge of a poultry plant. The manager must have had practice, a theoretical knowledge alone is of little use. Therefore search well into the credentials of the person you appoint as your manager.

In these days when the making of poultry houses is a great business in which many firms are engaged in turning them out by mass production methods, it is cheaper to buy the plant ready made than it is to have it made by local labour. In purchasing poultry houses assure yourself that they are well made, that they are efficiently ventilated and well lighted. Badly-lighted and ill-ventilated houses are the cause of much sickness and loss amongst poultry flocks. Never put up a house that has not a proper "dropping" board. Poultry manure is one of the richest fertilisers known to agriculturists and horticulturists. In some parts of the country it is sold for as much as £4 per ton, but to the farmer who has land enough to utilise it, it is worth a great deal more.

During the spring when young chickens are about, the first two months of their lives should be spent in a paddock near the rest of the poultry plant. After that they may be placed out on the grass fields, on ploughed land, and in the autumn in stubble. They will grow and thrive much better out in the fields in what are known as colony houses than they will if placed in confined runs, and when they are brought in later in the season as the time of laying approaches and are placed in the laying houses they will produce more eggs.

THE TIME OF BREEDING.

The early months of the year are generally supposed to be the breeding months, and when egg production is the object in view it is not necessary to hatch chickens before the end of January or the beginning of February, so that they will come on to lay early in the autumn as the old hens fall into moult and the price of eggs begins to go up. Never forget that fifty eggs in October, November, and December are worth 150 in April, May and June. When the production of table poultry is part of the scheme, hatching should commence in October and be carried on through the winter months until the end of February, so that when the demand for chickens for the table commences in February, as the market supplies of game diminish,

it will be possible to supply well-grown chickens and command a sale during the portion of the year when the demand is greatest in the principal markets. Farms which send their supplies to the London markets, or to such places as Harrogate, Cheltenham, Bournemouth, Eastbourne, Southport or Blackpool, will find that winter-hatched chickens pay well. The trouble and cost of production will be greater than that incurred in the raising of chickens in the early months of the year, but the profit will be proportionately higher if the thing is well done and the birds put on the right market at the right moment.

THE MODE OF HATCHING.

At the proper time and season there is no form of incubation to beat the natural, but in these days when we want hundreds of birds compared to the units of a few years ago, the natural methods of hatching and rearing under hens is much too slow and too costly. In the first place, broody hens cannot be obtained in large number in the winter, and in the second, extra time and labour is involved in attending to a large number of single hens and flocks of chicks. The hen can hatch but a dozen, and act as foster mother to only a few more, whereas by artificial incubation any number may be hatched, given the necessary incubator capacity. There are machines that will accommodate and hatch 40, 50, 60, 100, 200, 300, 400 and so on by stages to the double-decker mammoth machines which will turn out 10,000 at once. In the same way, by the modern methods of rearing, brooder houses may hold anything from 300 to 2,000, and foster mothers from 50 to 200.

Any poultry farmer who aspires to raise large numbers of chickens should adopt the brooder-house system of rearing. This has been much simplified in recent years by the provision of coal-burning and oil-burning brooder stoves. In connection with these modern stoves the heat can be more easily regulated than it can with brooder houses which are heated by the old-fashioned hot-water pipes, owing to the fact that as the chickens grow the hover can be raised, and at other times it may be raised or lowered to meet the vagaries of our British atmosphere. I have seen as many as 2,000 chickens being reared in a brooder house under one large hover, but I do not think it advisable to rear or attempt to rear such large numbers in one compartment. A brooder house with the capacity to rear 2,000 chicks should be divided into four, or better still, eight compartments. When large numbers of chicks are reared together there is much crowding, and the chicks do not thrive as when in smaller lots. Eight lots of 250 will produce far better grown chickens, chickens that are larger, stronger and healthier in every way, than will one

lot of 2,000. A brooder house such as this should have grass runs of about 30 ft. by 10 ft.

When oil-burning foster mothers or oil-burning brooder stoves are used it is necessary to pay the most careful attention to the oil reservoirs and to the wicks, or the lamps may smoke, and a good clutch of chicks be smothered, or slowly poisoned by inhaling the noxious fumes which arise from badly-trimmed lamps.

POULTRY AND GRAZING LAND.

In the past there has been considerable discussion as to the effect of poultry on pasture land. Some have argued that poultry have completely spoilt their pastures, whilst others have been equally emphatic in their convictions that the birds have improved them. My experience is that of many who have investigated the subject in a disinterested manner. I am convinced that poultry properly managed do real permanent good to pasture land. The harm is done when too many birds are put on the ground and it becomes sour and foul by the richness of the manure that the birds leave on it, and by the fact that they eat out all the good grass.

When the birds are not concentrated, but have a good range, there is no doubt whatever that not only is the pasture land improved, but the food-bill of the birds is considerably lessened, and the manure which the birds spread all over the ground nourishes it and causes the grass to grow quickly, and more than compensates for the grass which the birds consume, whilst the cattle or sheep on the land show their appreciation of the rapidly-growing grass by cropping it more closely than in other fields where poultry are never run. Apart from the good the fowls do in fertilising the ground, the fact must not be overlooked that they extirpate all wireworms and many other grubs which do harm to the pasture. The secret of the whole matter is that when chickens are put out in colony houses on the grass too many should not be put in any one field—not more than 60 to 80 to the acre.

When birds are placed on stubble the numbers here given may be doubled or even trebled, because here the circumstances are altogether different. The birds are put out to pick up all the corn which has fallen and which otherwise would be wasted, to consume much of the green growth and the seeds of weeds that are the reverse of serviceable to the land, to clear out all the wireworms, grubs, and other noxious insects, and at the same time to fertilise the land. They are not, generally speaking, on the land long enough to make it sour, therefore the only effect of their manure is to nourish the ground, and make it more prolific for crops that are to follow.

METHODS OF FEEDING.

The methods of feeding poultry have changed considerably in the last ten or twelve years. In the old days poultry-keepers used to give their birds a warm mash the first thing in the morning, some green food and a little corn at midday, and a good feed of corn at night. To-day few poultry farmers feed on these lines, and those who breed laying stock depend very much on dry-mash feeding. Dry-mash feeding represents a great saving of labour, and the birds are able to feed at any moment of the day, and so to keep up their vigour and energy during the laying period.

It may be useful to give a few examples of food rations. The first is that of one of our most successful commercial egg farmers from the month of September, when the young pullets are put in the laying houses.

First morning feed (given during the autumn, winter and spring months soon after daybreak, and during the summer not later than six o'clock) :—

Grain feed in the litter consisting of :—

4 parts oats.	} 1 oz. per bird.
2 " cracked maize.	
2 " wheat.	

Dry mash (the hoppers are opened at ten o'clock in the morning and kept open till the last grain feed is given at night) consisting of :—

4 parts bran.	} (By measure, not weight.)
4 " middlings.	
2 " clover meal.	
2 " maize meal.	
1½ " Sussex ground oats.	
1 " meat meal.	

Last feed, grain as before in the evening, about one hour before dusk. Quantity, 1½ ounces each bird.

During the summer months, that is, May, June, July and August, the maize meal is taken out of the dry-mash feed, and its place taken by two additional parts of oats in the grain feed. During November, December, January and February, and also in March if east winds are prevalent, the proportion of meat meal in the mash is raised to one-and-a-half parts, and twice a week fish meal is given instead of meat meal.

Twice a week this farmer gives a wet-mash feed in the evening instead of the last grain feed, compounded as follows :—

2 parts biscuit meal.	} (By measure, not weight.)
4 " bran.	
2 " flaked maize.	
1 " clover meal.	
1 " meat meal.	

These five meals are well mixed, then scalded, the scalding being done about two hours before the mash is fed to the birds. Just before the mash is given to the birds it is dried off with :—

4 parts middlings.
2 „ Sussex ground oats.

The birds are given a good handful each.

Green food is supplied regularly every day in addition to what they get for themselves from the grass runs. Kale and cabbage are suspended from the roof of the house by string, just out of the reach of the birds so that they have to jump for it and thus get exercise. Cabbage, kale, clover, sainfoin and ryegrass is given them two or three times a week at midday, being first passed through a chaff-cutter. Chopped swedes and mangolds are substituted during the time of the year when green food is scarce.

This system of feeding is also used for the breeding stock.

Another successful farmer uses the following for laying stock in grass runs :—

3 parts bran.
1 „ clover meal.
5 „ middlings.
1 „ Sussex ground oats.
1 „ maize gluten.
1 „ pea meal.
1 „ fish meal.
 $\frac{1}{2}$ „ dried yeast.
 $\frac{1}{2}$ „ charcoal.
 $\frac{1}{2}$ „ dried milk.

And to this mixture he adds a quarter of a pint of cod-liver oil to every hundredweight of meal.

This same farmer keeps a number of his birds intensively for commercial egg-laying purposes only. These he feeds on somewhat different lines, the dry mash in this case being composed of :—

4 parts middlings.
2 „ bran.
2 „ clover meal.
2 „ Sussex ground oats.
1 „ maize gluten.
1 „ pea meal.
1 „ fish meal.
 $\frac{1}{2}$ „ dried milk.
 $\frac{1}{2}$ „ dried yeast.
 $\frac{1}{2}$ „ charcoal.

To this is added three-quarters of a pint of cod-liver oil to every hundredweight of the dry-mash feed.

Green food and roots are supplied in manner similar to that of the other farmer, and the grain food morning and night is also the same, except that whereas all quantities are measured by the first farmer, the second weighs everything.

A Kentish poultry farmer uses the following dry-mash feed with success :—

5	parts	bran.
5	"	clover meal.
5	"	meat meal.
5	"	maize meal.
5	"	middlings.
5	"	Sussex ground oats.
5	"	bone meal.
1	"	barley meal.
3½	"	powdered oyster shell.
3½	"	charcoal.

To each hundredweight of this mixture $\frac{1}{2}$ lb. of salt is added. The birds are given grain food and green food on lines similar to each of the others. This is for the laying pens.

Other formulæ could be quoted, but those given above are fairly typical and are in use on farms where poultry are one of the leading features of the business.

There are still those who do not believe in dry-mash feeding, and will only use meals when they have been scalded. In the old days all were wet-mash feeders, and the mash was given only in the morning, the argument being that the birds should have a warm feed the first thing, which, being partly cooked, was quickly digested and sustained the birds through the morning until they were given a little corn at midday, and a heavier feed of grain at night. The idea of the heavy grain feed at night was that it digested slowly and the birds drew nourishment from it right through the long nights of winter. Then came the advocates of the warm mash at night, but that idea did not get fast hold of the poultry industry, as it was so quickly followed by the dry-mash theory. The latter, by reason of its labour-saving, has been generally adopted by those who are engaged in the utility side of the industry.

On the mixed farm, where poultry form one branch of the enterprise, wheat screenings may profitably be used in mashes, and also potatoes. A good useful mash, designed to utilise home-grown material as much as possible, may be composed as follows :—

5	lb.	potatoes.
2	lb.	wheat screenings.
1	lb.	bran.
2	lb.	pea meal.
2	lb.	meat meal.
1	lb.	Sussex ground oats.

The potatoes and wheat screenings should be well boiled, and, with the liquid, poured over the other ingredients of the mash. The whole should then be covered with a sack and left till it is nearly cool, when it is well mixed together and fed to

the birds. If the mash should be too soft and wet, use middlings and Sussex ground oats to dry it off.

HATCHING AND REARING.

Before the eggs are put into the incubators the machines should be thoroughly cleansed and run for at least a week. The eggs should be tested for fertility about the sixth day, and all which are unfertile should be removed and used as food for the old birds. I do not believe in using eggs for young chicks. Eggs from special hens should be placed in small pedigree trays in the incubator tray, so that as soon as the chicks hatch they may be toe-punched and thus recognised at a later stage.

The house or shed in which broody hens are set should be some distance away from the poultry houses and runs, or you may have trouble with your "broodies," especially at feeding-time, owing to their becoming restless and eager to get the food which they can hear is being fed to other birds. "Broodies" should be fed once a day. It is immaterial whether it be morning or evening, but it is of the greatest importance that it be at one and the same time every day. Generally it is found ~~that~~ the morning is the best time. The hens should be taken off the nests, fed, allowed a run for about fifteen or twenty minutes, given access to a dust bath and water, and then allowed to return to the nests.

Chicks that are hatched in incubators should be left there for from forty to forty-eight hours, and should then be removed to the foster mother, or brooder house, whichever is used. They should be given a little very fine flint grit on a tray, followed a couple of hours later by a light feed of kibbled wheat and a saucer of water. For the first four days nothing but kibbled wheat should be given in the way of food, that is, to chicks that are to be reared on dry food, but skim milk should be given them to drink instead of water and they should at all times have access to fine flint grit. If the dry-mash system of feeding is to be followed the following formulæ will prove of service after the first four days:—

Food for First Month.

DRY MASH.

- 8 lb. bran.
- 6 lb. middlings.
- 4 lb. Sussex ground oats.
- 4 lb. dry bone meal.
- $\frac{1}{2}$ lb. common salt.

These ingredients should be well mixed together and fed in small troughs with fixed bars across them.

DRY FEED.

For the same period the following should be the dry chick feed, unless one of the proprietary feeds are used :—

- 8 lb. kibbled wheat.
- 4 lb. kibbled peas.
- 4 lb. greats or coarse oatmeal.
- 4 lb. linseed.
- 4 lb. canary seed.
- 2 lb. hemp seed.

For the first week the chicks should be fed every four hours with the dry chick feed, letting them have access to the dry mash at all times. Fine flint grit should be always within reach of the birds, and the water or milk should be renewed at least four times a day. Green food such as sprouted oats, grass, lettuce and cabbage should be given several times a day, but it should be cut into pieces not more than $\frac{1}{2}$ in. long, or even smaller.

Food from Four to Eight Weeks.

As the chicks grow and get stronger so they must be put on stronger diet so as to help the feather growth. For the second month the following should be the regime :—

DRY MASH.

- 8 lb. bran.
- 4 lb. middlings.
- 4 lb. Sussex ground oats.
- 4 lb. meat meal.
- 4 lb. bone meal.
- 2 lb. clover meal.
- $\frac{1}{2}$ lb. salt.

The dry chick feed mixture may continue as before.

Food from Eight to Twelve Weeks.

When the chicks attain the second month the feather growth will be considerably advanced, and the food must be prepared to meet it.

DRY MASH.

- 8 lb. bran.
- 8 lb. middlings.
- 4 lb. Sussex ground oats.
- 4 lb. meat meal.
- 4 lb. bone meal.
- 4 lb. clover meal.

It will be noticed that no meat meal is allowed in the dry-mash feed for the first month, as the skim milk gives the chicks all the protein they require during those early weeks. If skim milk is plentiful it may be given daily for the first three months,

but after the first month the chicks should be given water as well.

Food from Twelve to Sixteen Weeks.

When the chicks reach this age more change must be made in their feeding or they will mature too quickly, as the food which has been given to promote quick and early feathering will, if continued, bring them into lay quicker than they should. It is needful to build their frames rather than to push them into early maturity. A wider ratio is therefore needed with a good supply of phosphates, which means larger frames and more stamina :—

DRY MASH.

8 lb. bran.
8 lb. middlings.
8 lb. Sussex ground oats.
4 lb. clover meal.
4 lb. meat or fish meal.
4 lb. maize meal.
4 lb. bone meal.

The dry chick feed may be replaced by the following :—

12 lb. clipped oats.
4 lb. kibbled maize.
4 lb. kibbled peas.

The dry mash for sixteen to twenty weeks will be the same, but whole oats and wheat alone may now be the grain feed. From twenty weeks onwards the birds may be fed according to the formula previously given for the feeding of adult laying birds.

Chickens that are reared under hens may be given the dry chick feed recommended for the chicks which are reared in the foster mothers and brooder houses, but there is difficulty in giving dry mash. Therefore they should be given the dry chick feed and a wet mash at each alternate feeding-time. A good wet-mash formula under such conditions is as follows : 8 lb. of biscuit meal, 4 lb. oatmeal or Sussex ground oats, and 4 lb. of middlings. This should be thoroughly scalded with boiling water and fed to the chicks warm at least four times a day for the first month.

For the second month they should have wet mash three times a day and it may be composed as follows :—

8 lb. bran.
8 lb. biscuit meal.
4 lb. Sussex ground oats.
2 lb. meat or fish meal.
2 lb. middlings.
2 lb. bone meal.

For the third month the middlings and meat meal may be doubled, and 2 lb. of clover meal may be added.

From the end of the third month the mash may be made up as below :—

8 lb. bran.
8 lb. middlings.
4 lb. maize meal.
4 lb. Sussex ground oats.
4 lb. pea meal.
4 lb. fish or meat meal.
2 lb. bone meal.
4 lb. clover meal.

In the way of grain, wheat and oats should be given. At the end of the fourth month the birds may be fed as the adults.

Chickens that are hatched under "broodies" should be kept in the nest for the first forty-eight hours, and then placed out in coops. Each coop should be given a small grass run of about 2 yds. by 2 ft., and each coop should be placed on fresh ground every other day the first week, and after that every day. As the chicks grow, the area of the run should be enlarged. The hens should be fed on wheat, and a bit of the chicks' mash when it is fed. At the age of eight weeks these chicks, like the brooder-house chicks, may be put out on the fields in colony houses in flocks of fifty to one hundred according to the size of the house. At eight weeks fifty birds may be put in a house 6 ft. by 4 ft., and they should be reduced by ten at the end of a fortnight, and each subsequent week by five, until only fifteen remain.

If it is desired to have larger flocks a house 12 ft. by 8 ft. would take 150 at the start, and they would have to be reduced by ten the first fortnight, and then by ten each week till the number got down to fifty. This number could stay until they were placed in the laying houses in the numbers previously given.

MARKETING SURPLUS COCKERELS.

Those farmers who engage in poultry-keeping solely with an idea of egg production, and using one of the light breeds for the purpose, will have a difficulty in disposing of their cockerels. The best method is to run them along with the other chickens for fifteen or sixteen weeks, and then give them a fortnight of special fattening; this will make them into nice small spring chickens, for which there is always a demand in the spring and early parts of the summer when game is not to be obtained. If the local market will not take them, the London market will always absorb them. Never put live birds on the rail, they lose from $\frac{1}{2}$ lb. to $\frac{3}{4}$ lb. before they reach the market, and if they arrive late in the day, and have to be kept in the hampers till the next, it means the loss of another 4 oz.

In these days a consideration of poultry-keeping on the farm would be incomplete without a reference to ducks. In older

times duck-keeping was generally understood to have reference to the raising of ducklings for the table, but during the last ten years the coming of the Indian Runner Ducks has opened up great possibilities as to the value of ducks as egg producers. The Buff, Blue, Black and Chocolate Orpington Ducks are also great egg-layers, as are the Magpies, a recent introduction, but since the establishment of Duck Laying Competitions three years ago, the Khaki Campbells have come to the front with a rush. All the breeds mentioned here are great layers. The egg-laying record of the world is held by an Indian Runner Duck which laid 363 eggs in 365 days. This bird did not lay on 363 days of the twelve months, but on 351, and on twelve days laid two eggs per day.

Those who have accommodation will find that ducks are very easily managed, and as birds from the best strains are most prolific layers, they are extremely profitable. To secure the best results it is advisable to let them have free range, as they are great scavengers and foragers and given the opportunity will find quite half their food in the hedges and ditches. The initial expense in commencing duck-farming is not so great as that for ordinary poultry, as the houses need not be so large, nor so elaborate, and there is little cost in the way of stakes, gates and wire-netting when they have to be confined. The netting for duck runs need not be more than 3 ft. high (half that for hens), stakes and gates the same, whilst there are no perches or dropping boards to be provided.

Duck houses need not be so high as those for hens, quite a foot less will do. A house for a small pen of half a dozen ducks may be 6 ft. by 5 ft. When they are kept in large flocks a house 20 ft. by 10 ft. will accommodate twenty ducks and five drakes, whilst one for a flock of 100 should be 80 ft. in length. The interior of all duck houses should be bedded to the depth of 5 or 6 in. with straw or other suitable form of litter. For ordinary commercial egg production nothing elaborate is needed in the way of nests, a few bricks put at right angles in the corners of the house will answer the purpose, or a couple of 6-in. boards could be so fixed; when large numbers are kept in flocks a goodly number of nest-boxes will be needed, but they may be constructed on the same simple lines.

Whenever possible the houses for ducks should be built near to a stream of running water, or a pond, the former for preference; this saves much labour, because ducks require an enormous quantity of water.

The one thing to remember in connection with ducks is that they must never be let out in the morning before ten o'clock, or they may lay their eggs in the water or in the ditches as they roam about.

FOOD FOR LAYING AND BREEDING STOCK.

For egg production ducks should be fed with grain in the morning—wheat or oats, or both—which should be given in troughs with water, or else should have been previously soaked in hot water for a few hours, water and grain both being fed. At night they should be given a mash, for which the following is a good formula :—

8 lb. bran.
8 lb. biscuit meal.
8 lb. oatmeal.
8 lb. middlings.
4 lb. maize meal.
6 lb. meat meal.
8 lb. green vegetables or roots (cooked).
2 lb. clover meal.

Occasionally, say twice a week, fish meal may be given instead of meat meal, and in spring and summer the quantity may be reduced by one-half when the birds have free range over fields and ditches.

A box containing crushed oyster shell and fine flint grit, and another containing sand should always be near the troughs from which the ducks are fed. In winter time these boxes must be attended to every day, because with damp and frost their contents are apt to become hard.

HATCHING AND REARING DUCKS.

Ducks may be hatched in incubators and reared in foster mothers and brooder houses, but unless large numbers are required the natural methods of hatching and rearing give the best results. When raised by artificial means they may be brooded in the brooder house in the same manner as chickens, but they do not require heat for so long a period, and at the age of three weeks may do without it. The heat needed when first removed from the incubator is 90 degrees, and this must be gradually reduced by 10 degrees per week. All brooder houses should have grass runs attached to them, the same as for chickens. In the early part of the season they may, when three weeks old, be removed from the brooder house, if it is necessary, into what are known as "Follow-on" houses. Later in the season when the weather is warm the ducklings may go into these "Follow-on" houses when they are two weeks old. These houses may be large houses divided into compartments, or single houses. A house, or compartment 16 ft. by 8 ft. will give accommodation to sixty ducklings, and the run to each should be about 16 ft. by 16 ft. It is a mistake to let young ducklings have too much liberty as they will walk and walk till exhausted.

FEED FOR DUCKLINGS.

During the first week ducklings need feeding every two hours, and their food may be biscuit meal and fine oatmeal mixed with skim milk, Sussex ground oats and middlings mixed in the same way, or oatmeal and middlings. The changes may be rung on any two of these meals. The food should be mixed into a crumbly condition. Water in troughs should be handy to the feeding-place, also some fine flint grit and sand in troughs or boxes, and a little sand may also be mixed with the meal.

Young ducklings should always be fed upon a clean board which has been well sprinkled with fine sand before the food is placed upon it.

From the end of the first week until the end of the sixth week the following food should be given every three hours:—

- 8 lb. middlings.
- 4 lb. bran.
- 4 lb. biscuit meal.
- 4 lb. Sussex ground oats.
- 1 lb. fish meal.
- $\frac{3}{4}$ lb. bone meal.
- $\frac{1}{2}$ lb. fine grit.

These ingredients should be well mixed together and scalded. As a change of diet once or twice a week they may be given boiled kibbled wheat and rice instead of the biscuit meal in the mash.

From the end of the sixth week onward they may be fed three times a day upon a mash composed of the same constituents, but instead of 8 lb. of middlings use 4 lb. and 8 lb. of Sussex ground oats instead of 4 lb. At three months they may be fed in the same way as the adult stock.

FEEDING DUCKS FOR MARKET.

The food given for the first week for ducklings that are to be reared as laying stock will also do for those that are to be marketed as early as possible, but after that the feeding is different. Ducklings that are bred for the table should be fed from the second to the eighth week four times a day with the following mash:—

- 8 lb. bran.
- 8 lb. biscuit meal.
- 8 lb. middlings.
- 8 lb. meat or fish meal.
- 8 lb. Sussex ground oats.
- 4 lb. bone meal.
- 1 lb. fine grit.

From eight to twelve weeks the food should be given three times a day as follows:—

8 lb. Sussex ground oats.
8 lb. middlings.
8 lb. barley meal.

These should be well mixed and scalded and to each 5 lb. of the mash, $\frac{1}{2}$ lb. of melted fat, or very fine chopped fat, should be added, also 1 oz. of fine grit to each 1 lb. of mash. The food must be mixed into a firm condition. Water must at all times be easy of access, also a trough of fine grit. Chopped green food should be given every day at midday.

Ducklings should not be kept beyond twelve weeks or the profit will become less. They should not be fed for twelve hours before being killed, and when killed they must be allowed to become thoroughly cold before being trussed or packed.

Those who favour laying ducks to hens can make profit and plenty of it, but rearing ducklings for table purposes is not to be advised unless one is near to London, or some fashionable resort.

C. A. HOUSE.

152, Stapleton Hall Road,
Stroud Green,
London, N.4.

THE WOBURN EXPERIMENTAL FARM AND ITS WORK (1876-1921).

	PAGE
HISTORICAL	111
THE SOIL AND FIELDS	114
CONTINUOUS GROWING OF WHEAT	116
CONTINUOUS GROWING OF BARLEY	118
ROTATION EXPERIMENTS—THE UNEXHAUSTED MANURE	
VALUE OF CAKE AND CORN	120
GREEN-MANURING	124
EXPERIMENTS ON GRASS LAND	127
FARMYARD MANURE EXPERIMENTS	131
EXPERIMENTS ON ENSILAGE	132
VARIETIES OF CROPS	136
EXPERIMENTS WITH CLOVERS AND GRASSES	138
EXPERIMENTS ON LUCERNE	139
SUGAR BEET	141
SPECIAL CROPS	141
PREVENTION OF "POTATO DISEASE"	142

	PAGE
"FINGER AND TOE" IN SWEDES	143
INOCULATION OF CROPS	144
MANURIAL EXPERIMENTS	145
EXPERIMENTS ON LIMING	148
MISCELLANEOUS EXPERIMENTS	148
WEED PREVENTION	149
FEEDING EXPERIMENTS :—	
(a) BULLOCK-FEEDING	151
(b) SHEEP-FEEDING	153
CALF-BEARING EXPERIMENTS	156
POT-CULTURE EXPERIMENTS	157

HISTORICAL.

The Council of the Royal Agricultural Society of England having decided on the giving up, by them, of the charge of the Experimental Farm and Pot-culture Station as from October 1, 1921, it has been felt desirable that I should give some general account of the work carried on there during the 45 years of its existence, and that a summary of the principal results obtained should be put on record.

Into the various causes which have led to the abandonment of this branch of the Society's scientific work, it is not for me primarily to enter, but rather to discharge the duty of giving the history and life-work.

The Woburn Experiments were commenced in 1876, at a time when the attention of agriculturists was being turned to two important matters—first, the remarkable results obtained at Rothamsted by Lawes and Gilbert with continuous corn-growing, and, second, the question of compensation for the consumption of purchased foods on the farm, the latter being the outcome of the passing of the Agricultural Holdings Act of 1875.

Agriculturists naturally asked, Firstly, would Lawes and Gilbert's results—obtained in the case of heavy land—hold equally good for light land? Secondly, are the compensation figures set out in Lawes and Gilbert's Tables justified in actual farm practice?

Both these subjects called for practical trial, and, as the outcome of a most generous offer by the 9th Duke of Bedford (Hastings Russell), the Royal Agricultural Society of England was, in 1876, given a farm on His Grace's Woburn Estate, known as Crawley Mill Farm, about 105 acres in extent (23 of which were grass and the rest arable), and situated one mile from Ridgmont Station and four miles from Woburn Sands. The Duke undertook to put the Society in possession of the farm and to bear the entire expense of its working, the Society providing only the scientific direction and management.

The Royal Agricultural Society, on taking over the farm, appointed a Committee, known as the Woburn Sub-Committee of the Chemical Committee, who undertook the full responsibility. The first Chairman of this was Mr. Wm. Wells, subsequent chairmen being Viscount Emllyn (afterwards Earl Cawdor), Sir J. Bowen Bowen-Jones, and Mr. J. L. Luddington.

The direction of the scientific side of the experiments was entrusted, at the outset, to Sir John Lawes and to Dr. Augustus Voelcker, the then Consulting Chemist of the Society, but, after a year or so, Sir John Lawes retired, leaving the direction in Dr. Voelcker's hands. He carried it on until his death in December, 1884, and early in 1885 I was appointed his successor, and held the directorship from then until October, 1921, a period of 36½ years.

The practical working of the farm and the carrying out of the details of the experiments were in the hands of a Resident Farm Manager who was directly responsible to the Committee. These Managers were mainly young men from agricultural colleges, and among them may be mentioned Mr. W. J. Malden, Mr. F. E. Fraser, Mr. Arthur E. Elliott, Mr. C. H. B. Cane, Mr. J. J. Forrester (killed in the South African War), Mr. W. H. Hogg, and Mr. F. C. Atkinson.

At first there were only the usual farm house (used as the Manager's residence) and farm buildings; but the Duke of Bedford erected, at his own expense, an excellent set of eight feeding boxes, these being provided with cemented floors and sides so that no leakage by drainage from manure could take place, and records of food given and manure produced could be accurately kept. A weighbridge for cattle was also fixed. Analyses required in connection with the experiments were carried out at the Society's London laboratory until 1897, when a Laboratory and Pot-culture Station were erected at Woburn, and the work connected with Woburn was henceforth done there. This addition—which enabled work to be done more expeditiously and satisfactorily—was largely the outcome of a bequest to the Society of £10,000 by the late Mr. E. H. Hills, who wished experiments to be conducted on the influence, on plants, of the less-commonly occurring constituents found in soils and plants. In this Pot-culture Station not only the special work of the Hills' experiments has been done, but the field experiments have been supplemented, and their extension to fresh matters of inquiry has been rendered possible, the laboratory also being made use of in connection with all analyses of soils, manures, feeding stuffs, etc., used in the field and feeding experiments, or having to do with agricultural inquiry generally.

These additions involved the transference of one of my

assistants from London, and from then to the close of 1921 there has been a resident research chemist-assistant in charge of this part of the work. The assistants so engaged have been Dr. H. H. Mann, M.Sc. (now Deputy Director of Agriculture, Bombay Presidency), Mr. H. M. Freear, F.C.S. (died 1904), Mr. Jas. Crabtree, M.Sc., F.I.C. (now Superintendent of Experimental Sugar Farms, Demerara), and Mr. A. Blenkinsop, M.Sc.* The Station since 1897 has been in communication with the Meteorological Office, and, as a Recording Office of the second class, reports to it regularly.

There has been only one foreman of the farm—E. Cook—who carried out his duties faithfully to the close, and died only a few weeks after the Society had given up the farm.

The Duke—Hastings Russell—continued to bear the whole charge of the farm and experiments during his lifetime; his successor did the same, as likewise did the next (the present) Duke until the year 1910, when, on the passing of the Development Act, he intimated his intention of withdrawing his help, considering, as he did, that the work was of public nature, and such as should be paid for by the State. After considerable trouble, the Society obtained, through the Board of Agriculture, a yearly grant of £500, and had to make up the balance of the expenditure out of its own funds.

In the earlier years of the farm's existence the Woburn Sub-Committee showed a good deal of activity in regard to its work, and both Sir John Lawes and Sir Henry Gilbert always extended their interest and help to it. Of the Sub-Committee, Mr. Chas. Howard, Mr. Chas. Randall, Mr. William Wells, Lord Vernon, Mr. R. A. Warren, Mr. Herbert Little, Sir J. B. Bowen-Jones, and Sir J. H. Thorold were, in their time, warm supporters of Woburn. At that time, indeed, Rothamsted and Woburn were the only real Experimental Stations in this country.

The acquaintance of members of the Society with the work was further stimulated, not only by the Annual Reports in the Journal, but by a yearly visit of inspection which was regularly held up to the time of the War. These gatherings were always largely attended. With the coming of the War these visits of members were abandoned and were not resumed later, on the score of expense; but it is undoubted that the giving up of these is, in measure, responsible for the less knowledge and appreciation by the Society generally of the work carried on. Further, the opening up of other Research Stations under the Development Commission, and the extension of Agricultural Colleges throughout the land had the effect of depriving Woburn of the position it had shared with Rothamsted, and, while the latter continued to receive increased subsidies, and was able to extend its work immensely, Woburn was left to maintain itself on a

very inadequate income, and had not the means to develop as it should have done if it was to keep pace with the times and the progress of science. After the War, the question of finance came up, and the abandonment of this part of the Society's work was decided on by the Council in November, 1920. As the issue was determined mainly on the question of finance, and of the results obtained not being commensurate with the expenditure, it is only fair to myself to point out that, as Director, I had nothing whatever to do with the financial side of the matter, or the working of the farm as a whole. This was entirely the duty of the Sub-Committee, I myself being solely answerable for the scientific side and the conduct of the experiments themselves. The one understanding was that the experiments "came first," and all else had to be subservient to them. Consequently, so far as making the farm "pay" was concerned, a considerable handicap had to be met, as must, more or less, be always the case when experimental work is involved. Rather than see the work cease and the long record of results broken, I determined to carry it on myself, and have so done since October, 1921.

On the Royal Agricultural Society of England ceasing their support, the Lawes' Agricultural Trust came to my assistance, and have acted as sponsors for Woburn, obtaining for my use thereby the renewal of the Development Commission's grant of £500 yearly. Further, they have made the Woburn Station a part of their own scheme, constituting me Honorary Local Director, and assisting me in every way possible by co-operation and advice.

THE SOIL AND FIELDS.

The soil of the Woburn farm is a light sandy loam of reddish colour, situated on the Lower Greensand formation. One field alone is of at all a heavy nature, this being situated just at the junction of the Lower Greensand and the Oxford Clay. The field first chosen as the future experimental one was found to be uneven in character and hence unsuitable, and the Duke of Bedford accordingly added to the area a field of 27 acres, from another holding, which proved to be admirably adapted to experimental purposes. This is known as "Stackyard Field" or, locally, as "The Experimental Field," and it has worthily fulfilled its object. The soil is a light sandy loam about one and a half feet deep, on a subsoil of yellow sand in which ironstone occurs. It has no artificial drainage, and, though light, it does not suffer greatly from extremes of moisture or drought. It is very easily worked, though very prone to weed-growth, the chief of which weeds are spurrey (*Spergula arvensis*) and hog-weed (*Polygonum aviculare*).

The following analyses—taken at the commencement in 1876—show the composition of the first and second depths of 9 inches each of the soil.

Analysis of Soil of Stackyard Field.

(Soil dried at 100° C.)

	1st depth of 9 inches.	2nd depth of 9 inches.
Organic Matter and loss on heating	4.132	2.432
Oxide of Iron	2.934	2.571
Alumina	3.610	2.840
Lime	.308	.205
Magnesia	.143	.162
Potash	.286	.235
Soda	.140	.217
Phosphoric Acid	.156	.115
Sulphuric Acid	.027	.023
Insoluble Silicates and Sand	88.264	91.200
	100.000	100.000
¹ Containing Nitrogen	.166	.094

Chemically, the soil is marked by its deficiency in lime, thus forming a marked contrast to that of Rothamsted, which has abundant lime. This fact has enabled the getting together and putting on record of facts and information as regards the action and need of lime, the accomplishment of which, had Woburn done nothing more, would alone have made the expenditure on it justifiable. The soil is but poorly supplied in organic (vegetable) matter, and has only moderate proportions of phosphoric acid and potash. The remarkable feature about it is, in consequence, the ready response which it gives to the application of manurial ingredients, added to which is an evenness in the nature of the soil over the whole area which makes it an ideal field for experimental purposes. Against this is the fact of its being a mile distant from the farm buildings, this greatly adding to the cost of cultivation, time taken in supervision, and inconvenience to visitors to the farm. Still, so valuable is a field of this uniform character that its results can bear the closest scrutiny and command the general attention which has been paid to it throughout its history. There is no other field on the farm which is really well adapted to experimental purposes, though several others—notably Lansome Field—have been used from time to time for more or less general trials. A like accuracy cannot, however, be claimed for them, and so it has come about that Stackyard Field has been

the one where the more scientific inquiries—such as those on the continuous growing and manuring of wheat and barley, on rotation and on green-manuring—have been carried out.

At the outset, the soil of the field was sampled at 15 different places over the whole area. Six successive depths of 9 inches each (54 inches depth in all) were taken, and, on these being analysed, the soil was found to be very fairly uniform throughout.

CONTINUOUS GROWING OF WHEAT.

Two and three-quarter acres are devoted to these experiments. Wheat has been grown every year without intermission, and the same manuring has been given, generally speaking, year after year. The primary object in these experiments has been to see how the wheat crop has been affected by the different constituents of manures, and to compare the results with those shown on the heavy soil of Rothamsted. The plan of manuring was substantially the same as that adopted at Rothamsted (Broadbalk Field). Originally the plots were $\frac{1}{4}$ acre each in size, but some have since undergone division and subdivision. The plots—at first eleven in number, but now twenty-two—represent four main divisions, (a) no manure—or minerals only (no nitrogen), (b) nitrogen as sulphate of ammonia—with or without minerals, (c) nitrogen as nitrate of soda—with or without minerals, (d) nitrogen in organic form—farmyard manure and rape dust.

The crop results for both grain and straw have been tabulated each year, and are published in the *Journal R.A.S.E.* A statement of the average produce of the first 20 years is given in *Journal R.A.S.E.*, 58 (1897), page 275. For the detailed results reference must be made to the accounts of each individual year; it is only possible here to set out the main conclusions reached.

For the first 20 years no marked change in the produce of wheat was noted beyond a gradual falling off on the unmanured plots from about 17 bushels to 13 bushels of corn per acre; after this period, while varying with season, the crop has generally been in the neighbourhood of 9 or 10 bushels per acre. Accordingly, it would seem that so long as the land is kept (as this has been) as free from weeds as possible, the produce, while going down at first, seems to reach a point below which it will not fall, even though wheat be grown year after year for 45 years. This is similarly shown on the heavier land of Rothamsted.

Mineral manures (phosphate and potash, but without nitrogen) have effected no practical improvement, but, when used along with nitrogen, have given the highest produce, exceeding even farmyard manure put on yearly.

An extension made in later years to ascertain which of the mineral constituents (phosphate or potash) was the more needed, has shown, in the case of wheat, phosphate to be the more necessary.

Farmyard manure in a dry year gives generally the best result of all. In the last year (1921), one of severe drought, it gave as much as 33.5 bushels of wheat per acre against 25 bushels with artificials. The residual value of farmyard manure has also been tried on these plots. After applying it each year (about 7 tons per acre of cake-fed manure) for five years, this was left off, and the land was found to still benefit from it up to the twentieth year after its last application. Rape dust, applied each year, though supplying only one-fourth the amount of ammonia given by farmyard manure, has yielded results falling but little below those with farmyard manure.

Nitrogen applied in the form of nitrate of soda has, all along, given consistently good yields, though the corn is of inferior quality, and the ears are apt to get "rusty." The soil is also specially prone to weed growth. Still, nitrate of soda, even when used alone—at the rate of 1 cwt. and also 2 cwt. per acre—has produced no actual failure of crop or marked deterioration in produce, though the application has gone on yearly for 45 years. The addition of mineral manures has, however, shown a profitable increase.

It is in regard to the use of sulphate of ammonia, however, that the most interesting results have been shown. For the first 20 years the results with sulphate of ammonia were practically equal to those with nitrate of soda supplying the same amount of nitrogen. In a wet year sulphate of ammonia did the better, in a dry year, nitrate of soda. Then, however, came a change; the sulphate of ammonia plots suddenly began to fail; spurrey spread over these plots, and a green growth of algae appeared on the surface of the soil. Chemical examination of the soil proved it to have become acid, and to have lost a large amount of its, always insufficient, supply of lime, removed in drainage, this having taken place at a much greater rate than with nitrate of soda or other applications. A remedy was sought in liming some of these plots, and the result has been to show that when lime is applied the fertility of the land can be restored, and as good crops grown as ever. At first, lime was applied (in the year 1897) at the rate of 2 tons per acre, and the plot receiving this still showed in 1921 (24 years later) that the influence of this single dressing had not entirely exhausted itself. On other plots lime in different amounts, viz., 5 cwt., 10 cwt., 1 ton, and 4 tons per acre respectively, has been put on with the double intention of noting the effect on the crop and the period for which the lime will exert an influence. In this way valuable

results have been obtained as regards the duration of lime; whereas 5 cwt. per acre is insufficient, 10 cwt. per acre has lasted for about 10 years, and 1 ton per acre for 15 years or more. An application of 4 tons per acre has not proved as beneficial for wheat as that of 2 tons per acre.

Lastly, it has been demonstrated, by leaving off the sulphate of ammonia or nitrate of soda for a single year, that practically nothing is left for a second corn crop to benefit from, thus showing a marked contrast to the case of farmyard manure.

CONTINUOUS GROWING OF BARLEY.

To these, 2½ acres in Stackyard Field are devoted; the plan and plots follow closely the wheat experiments just recorded. The individual plots, originally 11, now number 26. Moreover, the results are very similar as regards the action of the different manurial constituents applied. It is unnecessary, therefore, to do more than note the chief points of difference.

The soil being better adapted to barley than to wheat, larger crops have been grown in favourable seasons. On the other hand, an adverse season has told more severely. Again, where exhaustion of the soil has set in through the removal of lime under the influence of continued dressings of sulphate of ammonia, this has been more rapidly visible on the barley land than on the wheat area, the reason being, no doubt, that the barley, being a surface feeder, and the exhaustion of lime being most marked in the upper layers, the crop suffers more from the acidity produced, and does not push its roots, like the wheat, to the lower levels. Hence the results of the action of sulphate of ammonia and those of the subsequent use of lime were noticed earlier, and are of even more striking character than with wheat. Lime applied at the rate of 2 tons per acre required renewing after 15 years, as against 25 years with wheat, and 4 tons an acre, found unnecessary with wheat, has not proved so with barley. One ton of lime to the acre, similarly, only lasted 10 years. This, no doubt, is due, as stated, to the acidity of the surface soil, and to barley being a shallow-rooted plant. The same general results, however, hold good with both crops. Nitrate of soda, even after 45 years, continues to yield average crops, these being considerably increased by the addition of mineral manures (phosphates and potash). Of the mineral additions, potash has, with barley, shown itself the more called for. On the whole, nitrate of soda has proved somewhat superior to sulphate of ammonia as a barley top-dressing. As with wheat, so long as liming of the land has been kept up, sulphate of ammonia, alone or with mineral manures, has given excellent crops, these sometimes being the highest of the whole series, but, as soon as the lime falls, the crops fail; those treated

with sulphate of ammonia without lime have for many years been absolute blanks, and are merely kept on for demonstration purposes.

The unmanured yield, which was 21 bushels of corn per acre in the first 20 years, has gone down to 11 or 12 bushels. Minerals alone have produced a small increase only.

Farmyard manure gives a yield but slightly inferior to that of the highest artificial manuring, but rape dust, found so effective with wheat, has singularly failed to give a corresponding result with barley, the yield being little more than with no manure.

Putting together the practical conclusions to be derived from this work on continuous corn-growing, they have shown:—

1. Direct confirmation, on a very different class of soil, of the Rothamsted results.

2. That if land be kept clean, crops of wheat and barley can be grown on the same land without any manuring for 50 years and more. There is a rapid fall at first, and then a point is reached beyond which little change, other than that due to seasonal variations, takes place. In other words, the exhaustion of soils goes on very slowly after a certain level, peculiar to that land, has been reached.

3. That mineral manuring by itself is of no practical value in increasing a crop of wheat or barley.

4. That the proper manuring for corn is a combination of mineral and nitrogenous manures, or else farmyard manure.

5. That rape dust, as a manure, has answered well for wheat, but has not proved of benefit for barley.

6. That nitrate of soda can be used for many years, year after year, without causing failure of crop, but that sulphate of ammonia cannot be so used when the soil is deficient in lime.

7. That nitrate of soda and sulphate of ammonia leave practically no residue in the land for a second crop, but that farmyard manure, on the other hand, continues to show a residue for 10 years or more.

8. That soil, if deficient in lime, tends, when manured with sulphate of ammonia, to become acid, to grow spurrey, and to lose lime, so that, unless lime be applied to correct the acidity, total failure of the land to grow corn may ensue. This failure takes place more rapidly with barley than with wheat. If lime be applied in sufficiency, manuring with sulphate of ammonia can still be freely employed.

9. That lime, if applied at the rate of 1 ton or 2 tons per acre to arable land used for corn-growing, will last for about 10 years in the case of barley, and 15 years with wheat; 2 tons per acre would seem to be the most desirable amount for a single dressing.

It may be said by some—"these are all things that we are aware of, and they do not teach us how we can make corn-growing pay." But these experiments were not begun with that object, though it was at a time when corn-growing *did* pay. The object was to show what the several manurial constituents would do, and whether they would act as they had done in the Rothamsted experiments. This has been shown, and also, by a perusal of the quantities used and the crop returns obtained, anyone can find out for himself what each addition will produce, and can turn it into present-day money values.

Again, it has to be remembered that the experiments were begun 45 years ago, and what we *now* know was not known *then*. The lessons of these experiments, followed as they have been by readers and teachers of agricultural science, have, equally with those of Rothamsted, become incorporated into our stock of knowledge, and one is sometimes apt to forget where they have been derived from. Take the matter of soil acidity and the use of lime as a remedy for this—Woburn stands out alone as the one place in the whole world which has yielded results of such paramount importance in agriculture, and where, to this day, they can be demonstrated. The soil of these plots has, because of its uniqueness in these respects, been largely drawn upon and made use of as the basis of further investigations at Rothamsted and elsewhere, and the maintenance of the continuity of the work is recognised by all scientific inquirers as being of the highest importance. Had it not been that the experiments were continued after the first 20 years—at a time when some were disposed to urge their cessation on the ground of their having yielded all the information they were likely to give—the facts recorded as regards soil acidity and the influence of lime would never have been brought out, nor would Woburn have been the unique demonstration ground and storehouse of further research which it has since proved.

May this not be equally urged now as a ground for its continuance, for no one can tell what may not be lost by giving up a place which has already achieved such results? The Lawes' Agricultural Trust, at all events, have been so impressed with this view that they have used their influence in every way for providing for its continuance.

ROTATION EXPERIMENTS.

The Unexhausted Manure Value of Cake and Corn.

The second—and probably the main—series of experiments contemplated when starting the Woburn Farm was that designed for the purpose of testing, in actual farm practice, the accuracy

of Lawes and Gilbert's estimates of the unexhausted manure value of purchased foods, as set out in their then recently published Tables.

Up to the time of the issue of these Tables (1875) it had been, and still is, in some antiquated farm leases, the practice to award compensation to an outgoing tenant, in respect of unexhausted manure made from purchased cake, corn, etc., on the basis of the original cost of the same, a certain proportion of this being deducted for each year since application. Lawes had, however, as early as 1861, pointed out how faulty and unscientific such cost basis was, the price paid having often no relation whatever to the manurial value; and, later, in conjunction with Gilbert, he drew up the Tables referred to and in which the basis taken was the respective amounts of nitrogen, phosphoric acid, and potash supplied in the various foods used. This had at least a scientific basis; the question arose, however—Would it be found to work out in practice? To this end the Rotation Experiments at Woburn were devised.

Sixteen acres of Stackyard Field were set apart for the purpose; they were divided into 4 plots of 4 acres each, the intention being to have on each 4 acre area one of the crops constituting the ordinary four-course rotation—roots, barley, clover, wheat. In this way the inequalities due to season would, over a series of years, be eliminated.

The two foods taken for comparison were decorticated cotton cake—a highly nitrogenous one, and figuring very high in Lawes and Gilbert's Table (nitrogen 6.9 per cent.), and maize meal, an essentially starchy food, figuring low in the Table (nitrogen 1.7 per cent.). Each rotation was divided into four plots; on two of these (plots 1 and 2) farmyard manure made with cake or corn was applied, or the foods themselves were fed on the land; in the other two the calculated equivalents of the cake- or corn-manuring were applied direct in the form of artificial manures.

At the outset—and for eight years (1876–1884) the root-crop (swedes) was manured with farmyard manure made in the feeding boxes by bullocks which consumed, with other foods, decorticated cotton cake in the one case (for plot 1), and maize meal in the other (for plot 2). Plots 3 and 4 had farmyard manure made without cake or corn, and artificial manures equivalent to the cake and corn manure respectively were applied direct. The root-crop was weighed and removed from the land, and barley followed. Clover was sown in the barley, the barley reaped and the clover fed off the next year by sheep receiving decorticated cotton cake (plot 1) or maize meal (plot 2), or their equivalents in artificials were subsequently applied (plots 3 and 4), wheat completing the rotation.

After continuing this for eight years (1876-1884) the surprising fact was brought out that, taking the four crops of the rotation, course, there was but little increase from the cake-feeding over the maize. In the first crop (barley) of the rotation there was always a difference in favour of the cake, but, after this, there was nothing to choose between them as regards the clover or the wheat. Moreover, the land, it was found, was bearing, in the four years of the rotation, a maximum crop of wheat even where the supposed poorest manuring was given. This led to the conclusion that the land was being too liberally treated, and so the differences due to the richer food could not "tell." Accordingly, from 1884 the plan was changed, and one embracing a less high manuring was adopted, the root-crop being no longer manured, and cake and corn being only given once in the rotation, viz., when the roots were fed off by sheep. Further, the clover crop was not fed off by sheep as before, with cake and corn, but was removed as hay, wheat following without further manure. This continued until 1896, but still the results were much as before.

Accordingly, the plan was once more changed, and, as a preliminary, for a number of years (1897-1904) unmanured crops of barley were grown over the whole area with the object of exhausting the over-fertility. The crops continued, however, to be weighed and recorded each year.

It is noticeable that during all this period (28 years from the outset) red clover was grown on each rotation every fourth year. Once or twice a crop of peas or tares was substituted, but in no case was there that falling-off and dying-off of the clover crop in patches which is known by the general, but undefined, term "clover sickness." Once more it was found that the only difference in the crops was that in the barley, the first crop after the feeding of the cake or corn on the land, but the wheat crop after clover was just as good when maize had been fed as when decorticated cotton cake had been given. It was then that the information recently yielded by Hellriegel's discoveries as to the way in which clover utilizes atmospheric nitrogen came to the explanation of a part, at least, of the problem, and accounted fully for the wheat crop being as described. So long as a good clover crop could be grown on both plots it was not likely that a difference would be shown.

When, from the equality of the crops grown, it was believed (1904) that the soil had again been brought to an uniform level, the work was resumed, the idea now being to have a rotation in which clover did not figure, and, accordingly, from 1904 on, the experiment—now reduced to two areas of 4 acres each—was carried on with mustard as the green crop. This

did not, however, prove very satisfactory, and no different results from before were shown.

Finally, in 1918, the old plan of growing clover was reverted to, as it was felt that if the results were to have any bearing on actual farm practice, they must be conducted on the lines the farmer would adopt. The single manuring with cake and corn, when the roots were fed off, was kept to, the clover or "seeds" crop (as the case might be) being made into hay. The results up to 1921 have shown no practical difference from the earlier ones. The barley crop following cake-feeding of the roots is, as a rule, larger (though not markedly so) than that after corn-feeding, but no difference is found, to speak of, in the other crops, none, at least, which can be put down to the manuring.

The consideration of these results and what they mean has given rise to much uncertainty, and it is not too much to say that no one has been able to provide any satisfactory explanation of what seems so contrary to general experience, nor has anyone—scientist or practical farmer—been able to make any useful suggestion as to the best way of tackling the problem. To myself, who have seen this carried on under my own eyes for 37 years, I frankly say it has been insoluble. For the care with which the work was done and the accuracy of the records I can vouch; that, after so many years' work and expense, no more definite results have been attained is but an instance of what the scientific worker may have to meet, as it has been my lot when face to face with this problem.

I cannot think, moreover, that it will have been altogether thrown away, and, indeed, the more recently modified opinions of agricultural chemists as regards unexhausted manure values tend to support the accuracy of the experiments, rather than to suggest that any possible misleading conclusions may be drawn from them.

Two alternatives seem to present themselves: (1) Is it possible that the results obtained may be due to the particular kind of land? (2) May not the results, after all, be perfectly justified, and go to show that our preconceived ideas of the value of cake-fed manure on the land as against corn-fed are exaggerated, and that the difference of value, as set out in Lawes and Gilbert's Tables, and since revised (1914) by A. D. Hall and myself, is overstated?

As regards (1), it can only be replied that in the Woburn soil one has what would be considered typical sheep-feeding land—sheep and barley land—and the answer given here must apply to a great deal of similar land.

As to (2), where no one has been able to point out, or even suggest, the occurrence of some decided flaw in the method of carrying out the experiment, and while one is naturally averse

to throwing over beliefs of long-founded nature, and supported, it would appear, by the experience of practical farmers, there is hardly any avoiding the conclusion, that the Tables of Unexhausted Manure Value in general use are over-stated as regards the value to be attached to cake-fed dung in particular. In other words, the Woburn experiments, though seeming to be a failure, may really afford very valuable support to the more recent expressions of opinion on the subject of unexhausted manure value. Rotation experiments started by A. D. Hall at Rothamsted, and since continued by E. J. Russell, have tended to throw considerable doubt on the believed great superiority of cake-fed manure to ordinary farmyard manure (without cake). Moreover, it has been shown that the higher nitrogen of cake as compared with corn—when fed to stock—takes largely the form of volatile and readily soluble nitrogenous matters, and that, while a marked increase may be shown in the first crop after their use (as in the barley crop at Woburn), yet, after this, there is a rapid fall, and there is little left for after-crops to show any difference between cake-fed and corn-fed manuring. It is more than probable, therefore, that the Tables will undergo a revision in this direction, and that the Woburn Rotation Experiments, instead of having to be written down as failures, may have been a factor in contributing to a result of so much importance in all cases relating to unexhausted improvement.

It should be mentioned here that, in addition to the Rotation Experiment in Stackyard Field just described, a further attempt to solve the question of unexhausted manure value was commenced in Lansome Field in 1885 and was carried on regularly until 1903. In this the same rotation was employed, and the root crop was fed off with decorticated cotton cake or maize meal, or else it was fed alone and, for the subsequent barley crop, decorticated cotton cake meal or maize meal was spread on the land.

But, though the attempt was long persisted in, the land proved not to be uniform in character, and the results obtained were not sufficiently consistent to warrant the drawing of any proper conclusion. Accordingly, the work was abandoned after 1903, and need not be further referred to.

GREEN-MANURING.

The series next in importance comprises the experiments on green-manuring. These were commenced in 1895 on Lansome Field, and an extension of them was begun in Stackyard Field in 1911, both sets having since been carried on continuously. They had their origin in the discoveries of Hellriegel,

to which reference has been made under Rotation Experiments (page 122). If, it could be argued, certain leguminous crops, like clover, can obtain their nitrogen from the air, their growing, as against that of a non-leguminous crop, must result in a corresponding increase in the richness of the soil in nitrogen, and a better corn crop ought to be the subsequent result. It was thought well to put this to the practical test, and, while the theory had coincided fully with practice so far as clover was concerned, little was known as to other leguminous crops such as tares (vetches).

Unfortunately, the soil of Lansome Field, while lighter and poorer in quality than that of Stackyard Field, though not different in texture, is not of such an uniform or satisfactory nature, and so the results cannot be regarded as carrying the same quantitative value. This, however, has not interfered with the forming of the general conclusion which the repetition of the trial over a considerable series of years has enabled one to come to.

In Lansome Field it was determined to grow green crops and to plough them in, then following with a corn crop, and so continuing, taking, one year, a green crop, and, the next, a cereal. The green crops selected were (a) Tares, (b) Rape, (c) Mustard; and 3 plots, one-quarter acre each, were marked out and sown with these crops in the spring of 1895. When grown, the crops were turned into the soil and a second crop of each grown, this in turn being ploughed in green, after which the land was prepared and put into wheat. That the necessary soil-constituents might not be lacking, superphosphate and kainit were applied, and also lime.

Occasionally, in place of a wheat crop, barley has been taken, and once or twice the land has been left fallow in order to clean it, this field being very subject to weeds, more especially "Horse-tail" (*Equisetum arvense*). In the later years, rape (which was always a difficult crop to grow here) has been abandoned, and the issue kept to a comparison of tares and mustard.

Year after year when a corn crop has been reaped—be it wheat or be it barley—the same result has been found—the corn crop after the less-nitrogenous green-crop, mustard, has been superior to that after the more-highly-nitrogenous tares. This is precisely the opposite of what one would have expected, and much labour and thought has been expended in trying to find a solution of the problem. To add in this, soil from the field plots has been taken and transferred to pots in the Pot-culture Station, and there treated with various manurial applications to see if any of them would succeed in bringing out the expected benefit from growing tares. But all have resulted in the one conclusion which must, for the time anyhow, be accepted,

that, though it can be shown—as has been done by repeated analysis—that the tare soil is the more enriched in nitrogen, yet the succeeding corn crop does not appear to be able to benefit from it.

On two occasions the green crops grown were cut, weighed, and analysed, and it was shown that the tare crop was heavier, and supplied more organic matter and more nitrogen than did the mustard, and also, as stated, that the soil was left richer in nitrogen.

Here we were met again with a problem a satisfactory solution of which has not yet been found, though many have had a hand in it. In this case it was not, as with the Rotation Experiments in Stackyard Field, that the maximum crops for the land were grown with the less nitrogenous manure, for the crops were never large, and often very poor ones. It was generally noticed with wheat that, during the winter and early spring, the wheat after tares looked the better, but, as soon as warmth came and the soil was less moist, the mustard plot went ahead and so continued until harvest. This led to a suggestion that the question might turn upon the water-contents of the two soils, and experiments in the Pot-culture Station gave some support to this, though not a complete explanation.

Adopting a suggestion made as to whether the same results might obtain if, instead of ploughing in the crop green, it were fed off on the land by sheep, an extension of the work was begun in 1911 in Stackyard Field (series A). The four-acre area comprising this series was laid out in the same three green crops, these being grown as in Lansome Field, except that, instead of being ploughed in green, they were fed off by sheep which received also some undecorticated cotton cake. The wheat crop followed, and this alternation of green crop and cereal was continued year by year. After a time, as in Lansome Field, the growing of rape was given up and the issue confined to tares and mustard.

But, despite the change of plan, the same result as in Lansome Field was found, the wheat crop after mustard being in every case heavier than that after tares fed off. It was shown, as before, that the tare soil was the richer in nitrogen, but, for some reason, yet unexplained, it did not become available for the succeeding corn crop. Nor could it be said here that the plots were small and, possibly, not representative; here were areas of 2 acres each, with sheep feeding-off the green crops just in the same way that the ordinary farmer would adopt; moreover, the land was known to be uniform and of fair quality. One striking feature was shown, which, however, only added to the difficulty of the situation—and that was that, despite the fact that good—sometimes excellent—green crops, both of tares

and of mustard, were grown, and that these were returned to the land in great measure by the sheep feeding on them, and that cotton cake in addition was given, yet the crops of wheat were lamentably and unaccountably small, and quite incommensurate with what might have been expected from such treatment as they had had. In 1920 the wheat crop amounted to 9.7 bushels of corn only on the tares plot, and 14.2 bushels on the mustard plot, whereas an adjoining plot, where clover had preceded, gave 27.1 bushels of corn per acre.

This points to the same conclusion as that come to in the case of Lansome Field, viz., that there is some, as yet unexplained, reason for the fact of the nitrogen derived from the tare crop not being utilised by a corn crop. Also that, so far as the work has gone, it shows that a more-nitrogenous green crop is not necessarily the better manuring for a succeeding corn crop, whether the green crop be ploughed in or be fed off on the land.

EXPERIMENTS ON GRASS LAND.

- (a) Laying down pasture.
- (b) Elliot's mixtures.
- (c) Manuring of grass-land.
- (d) Liming of grass-land.
- (e) Mowing or grazing.

(a) *Laying down Pasture.*

An arable field (Great Hill Bottom) having to be put down in pasture in 1886, it was thought well to try different mixtures in doing this. It was then the time of the great "rye-grass" controversy, in which the late Mr. de Laune, Mr. Carruthers, and Dr. Fream took an active part. These particular experiments at Woburn were made under Mr. Carruthers' direction. The field of 7 acres was divided into strips; on some of these the mixtures used included rye-grass and others did not, the intention being to see whether rye-grass was permanent or not, and if its inclusion or exclusion were desirable. After carrying on the work for several years, it was found that rye-grass, far from dying out, came to be a constituent part of the pasture, and that it had spread even on to the plots from which it had originally been excluded.

(b) *Elliot's Mixtures.*

About the year 1900 considerable attention was being directed to the system, advocated by the late Robert H. Elliot, of Clifton Park, Kelso, for laying down poor, hard, and stony land with seed mixtures comprising strong-growing and deep-rooting plants such as chicory, burnet, kidney vetch, etc., the idea being that these acted as "tillers of the soil," breaking up

the hard soil and opening it up, thereby improving both aeration and drainage.

Though the soil of Great Hill Bottom—on part of which this was tried—was hardly of the description named, it was by no means a good soil. The mixtures were sown in 1901 and kept down until 1908, and it must be said that they succeeded very well and formed quite good pastures. Nor did the chicory and other plants get abnormally strong, and they were always eaten readily by sheep and so kept down.

(c) *Manuring of Grass Land.*

On Broad Mead (16 acres) experiments on the manuring of grass land have been carried on from time to time.

One set, commenced in 1893 and continued up to 1900, comprised a comparison of (1) gypsum, (2) basic slag, (3) superphosphate, (4) no treatment, (5) lime. The applications, first put on in 1893, were renewed in 1899; the field was, as a rule, alternately mown and grazed.

The general result was to show the benefit of lime, this giving the freshest, greenest, and most even pasture, and being the best grazed by stock. When mown, the lime plot also gave the best return in hay. Basic slag, singularly enough, did not seem to have any effect, though the soil here is heavier than on other parts of the farm.

In 1901 a change was made in the plan; these plots were given up and a fresh series of six plots started on another part of the same field. These were manured in the winter 1901-2, per acre, as follows:—

Plot 1.—Basic slag, 10 cwt.; nitrate of potash, 1 cwt.

Plot 2.—Superphosphate, 5 cwt.; sulphate of potash, 1 cwt.

Plot 3.—Basic slag, 10 cwt.; sulphate of potash, 1 cwt.

Plot 4.—No manure.

Plot 5.—Lime, 2 tons.

Plot 6.—Farmyard manure, 12 tons.

The manurial applications were renewed in 1904, 1906, 1909, 1913, and 1920 with the exception of the lime—on plot 5—which has not been put on since 1909. Superphosphate 3 cwt. and sulphate of potash 1 cwt. per acre were given to it in 1910 and in 1913, but not since. Also, on plot 1, 3 cwt. of kainit was substituted in 1913 and 1920 for nitrate of potash.

The general result of this work has been to show that basic slag, which, when used by itself, effected no improvement, has, when potash in some form has been added to it, proved of marked benefit, and plot 3 has, on the whole, given the best crops of hay, though plot 2 (superphosphate and sulphate of potash) has been but little inferior. Kainit has not proved

such a satisfactory addition as sulphate of potash. The heaviest crops of hay have resulted from the farmyard manure, but the hay is coarse and inferior, having but little clover in it; nor is this plot as well fed down by stock as are the others. Though not giving an equal yield of hay, the lime plot (No. 5) stands out from all the others by reason of its freshness and evenness, this plot being grazed much the closest by stock.

Botanical analyses of the herbage made by Professor Biffen in 1903 showed that, while the hay from the farmyard manure plot comprised only 8½ per cent. of leguminous plants, and that from the unmanured plot 11 per cent., the lime had increased this to 16 per cent., the basic slag and sulphate of potash to 19 per cent., and the superphosphate and sulphate of potash to 27 per cent.

Sulphate of potash as an addition either to basic slag or superphosphate would thus appear to be the best for producing a good hay crop combined with fair grazing, whilst, considering the land as a grazing area only, the result would seem to be best attained by the use of lime.

(d) Liming of Grass Land.

(1) Following on the improvement effected by lime, further experiments were begun in 1910 on other portions of the same field (Broad Mead). The object was to see what *kind* of lime would do best. A farmer about to apply lime to his land would naturally make use of that kind which he had nearest at hand, or which, consistently with its quality, he could best procure if it had to come by rail. Accordingly, 6 plots were set out to which were severally given the following varieties of lime, each being put on at the rate of 2 tons to the acre:—

Plot 1.—Buxton lime.

Plot 2.—Chalk lime.

Plot 3.—Magnesian lime.

Plot 4.—No lime.

Plot 5.—Lias lime.

Plot 6.—Oolite lime.

The applications were first put on in 1910 and were renewed in 1916, but not since. The field has, as a rule, been mown and grazed alternately.

The experiment has shown that all the lime applications have done more or less good, the untreated plot remaining much the roughest and being not so well grazed. The Buxton lime and the chalk lime have done decidedly the best, being followed by the lias and oolite limes, which, in turn, have proved superior to the magnesian lime.

(2) An extension of the work was made in 1913 by the setting

out, in the same field, of 5 other plots, on which lime in different forms was tried. The plots were :—

Plot 1.—Ground chalk.

Plot 2.—Ground limestone.

Plot 3.—No lime.

Plot 4.—Ground lime.

Plot 5.—Lump lime.

In this case the applications were made on a *cost* basis, the same sum, viz., 20s. per acre, being expended on each plot—the cost being independent of carriage, cartage, etc. The first applications were given in 1913, and these were repeated in 1920.

The results have not been so definitely marked as in the preceding series, and the increases have not been large, but no plots have done better than those to which either ground chalk or ground limestone have been applied.

(c) *Mowing or Grazing.*

The question has often been asked, but never, so far as I know, exhaustively tried, whether the continual mowing or the continual grazing of grass land, or, again, alternate mowing and grazing, be the best practice. Of course, the answer must depend largely on the particular conditions of the case, but the comparison of areas thus differently treated, side by side, could not but be instructive.

With the view of providing a place isolated from the rest of the farm, and where the Society's tuberculosis experiments could be carried out, an adjacent holding, one mile off and comprising 55 acres of grass land (Charity Farm), was taken over in 1907.

On the conclusion of the tuberculosis experiments, this area was thrown into the Woburn Farm; the buildings were used for calf-rearing experiments, and, on one of the fields (Westbrook), an experiment on the above subject was started. The 19 acres composing the field were divided by wooden railings into three equal areas, one of which was to be mown every year, a second grazed every year, and the intermediate one alternately mown and grazed.

In 1913 the whole area was hayed to see if the three parts were fairly alike, and, this proving so, basic slag, 7 cwt., and sulphate of potash, 1 cwt., per acre were spread over all three parts, the recording of results starting with 1915 and continuing until 1921. In the case of the mown plots a return, reckoned to be equal to the crop removed in feeding, was given in the form of steamed bone flour.

It was found that when hay was taken, the weight of hay

was rather more on the "alternate" plot than on the "always mown" plot; the former had more clover and gave a distinctly improved "bottom." But neither of them was at all comparable with the third plot ("always grazed") in respect, at least, of luxuriance of clover, excellence of bottom herbage, and closeness of grazing by cattle.

FARMYARD MANURE EXPERIMENTS.

(a) *Losses in Making and Storing Farmyard Manure.*

To Woburn, agricultural science is indebted for the most complete series of experiments made in this country on the losses which Farmyard Manure undergoes in its making and subsequent storing. The results obtained were largely drawn upon by A. D. Hall and myself when we were engaged (1902) in a revision of Lawes & Gilbert's Tables of 1875 (see *Journal R.A.S.E.*, 1902, pp. 85-88). The feeding boxes erected by the Duke of Bedford in 1877 came in most usefully for this work, inasmuch as they were, practically, bullock pits having cemented floor and sides, so that no urine could escape as drainage. Bullocks were put in the eight separate pits; all the litter given was weighed, as also were all the foods and the water given; the manure remained in the pits until the experiment was over, a little fresh litter being spread each day. The manure thus formed a compact, well-trodden mass, which was then removed, being sampled as it was taken out, and analyses were subsequently made. The manure was stored in a heap on ground well-beaten down, and covered with straw and earth. When the heap had settled down, it was thoroughly covered with earth and left until the autumn, when it was used for the continuous wheat plots, and samples of it were again drawn and analysed. The result of this storing was that at no time was there any leakage of urine or washing out of the soluble constituents by rain, and the manure, when taken out, was found to be thoroughly well rotted.

From the first lot of samples it was ascertained what loss there had been during the making of the manure; from the second lot what the subsequent loss in storing was.

The manure was, of course, made under the best possible conditions; this, however, was necessary in order to provide a definite starting point, deductions from which could be made according as the conditions were proportionately less satisfactory.

These experiments were carried out during the years 1899, 1900, and 1901, and the average of the three years was taken for stating the general result, which was to show that the loss during the making of the manure (which was cake- and corn fed) under these conditions amounted to from 15 to 18 per cent.

of the original nitrogen, and that another 15 to 18 per cent. was lost in the storing, thus making a total loss of 30 to 35 per cent. of the total nitrogen contained in the original food and litter, by the time the manure was put on the land. As it was hardly likely that in ordinary circumstances such care would be taken as was here the case, it was estimated generally that in ordinary good farming practice the loss of nitrogen might fairly be put down at 50 per cent., and this figure was, accordingly, adopted in framing the revised Tables of Unexhausted Manure Value.

(b) *Increase of Bulk of Manure produced by Consumption of Hay.*

In connexion with a practice adopted by valuers in the North of England, when hay is, in the one case, sold off the farm, or, on the other hand, consumed on the holding, it was found desirable to ascertain by actual experiment to what extent the bulk of manure produced is increased by the consumption of hay. Here, again, the feeding boxes just referred to came in most usefully, and, after feeding during the winter 1912-13 one set of bullocks without hay and another with hay in addition, it was found that the consumption of 1 ton of hay gave an increase, in volume of manure produced, of 55.18 cubic feet, or rather over 2 cubic yards, this weighing 1 ton 9 cwt. more. It was noticeable that the hay-fed manure was distinctly the better made.

The experiment was repeated in the winter 1916-17 on a more extended scale, there being now four sets of bullocks, one set consuming the standard diet only, a second set this and hay additional, a third, cake additional, and a fourth, malt culms extra. Again, the extra bulk of manure produced was measured, and the results with hay were much as before, 2.38 cubic yards more being obtained from consuming one additional ton of hay. With cake additional to the standard diet there was but slight increase of bulk (0.28 cubic yard for 1 ton of cake consumed), but malt culms (a bulky food) gave even more increase than hay (2.94 cubic yards from 1 ton consumed).

Inasmuch as the practice in the North of England is to reckon 1 ton of hay as producing, when consumed, an additional 5 cubic yards of manure, this duplicated experiment shows clearly that the amount is considerably over-estimated.

The accounts of these experiments are recorded in *Journal R.A.S.E.*, 1913, pp. 410-11, and 1917, pp. 244-8.

EXPERIMENTS ON ENSILAGE.

The practice of ensilage has of late years undergone considerable modifications, mainly, however, in respect of the mechanical appliances used. It is seldom that one now finds

a barn converted into a silo, or a silo dug out of a hillside; these have been almost universally replaced by the American device of large upright silos standing in the open, and made of wooden staves or concrete blocks.

But there has been little change as regards the green crops used, the method of their preservation, the changes that they undergo during storage, and the nature of the final product.

It may be forgotten perhaps—after this interval of time—that Woburn was among the first to take up this work, and that the *Journals* of the Society for 1886 and 1887 contain detailed accounts of experiments made in the years 1884-5, 1885-6, and 1886-7, not only with different kinds of green fodder, but giving the detailed composition of the product, the losses involved in the process, and the feeding value of the silage, as determined by actual feeding trials.

In 1884 the Duke of Bedford gave the Society the use of a barn in Woburn Park in which five silos of different size, capable of holding from 10 to 30 tons of green fodder, were constructed, with brick walls cemented over, and concrete floors, the doorways being of jointed boards. Boards were placed on the top of the green fodder, and the weighting material consisted of stones put in wooden boxes and resting on the boards. All the green fodder put in the silos was weighed and analysed, and similarly, all that was removed was weighed and analysed at intervals. Records were kept of the temperatures attained, the losses incurred and the changes in composition. Lastly, feeding experiments were carried out on bullocks receiving the silage, as compared with others having other food of somewhat similar nature, each set otherwise receiving the same foods.

In the first year, 1884-5, the experiment was with grass cut from the park land, this being of decidedly poor quality. The silage made was, in the subsequent feeding experiments, compared with roots and hay, the relative live-weight gains being:—

	Gain per head daily
Bullocks feeding on silage	11 lb.
„ „ „ roots and hay	2½ lb.

Thus, when inferior grass was used for silage, roots and hay of good quality and giving approximately the same amount of dry matter as the silage, proved decidedly the better feeding, and the experiment brought out what is now well recognised, viz. that, whilst ensilage may provide succulent fodder for winter feeding, the quality of the product is very dependent upon that of the original material used, and one can never expect to make good feeding material out of poor stuff, although the process may prevent the latter from being altogether wasted.

The loss by moulding was not great; at the sides this never

penetrated above 2 in. inwards, except by the doorway, where mould extended to about 1 ft. inwards. The waste was found mostly at the corners, where trampling down and pressure had not been so regular. In each successive year these defects were remedied, and, as experience increased, the losses owing to spoiling of the material were reduced to quite small proportions.

This same year a small silo was filled with chaffed clover. The total loss through evaporation, moulding, etc., was 8 per cent., 6·6 per cent. of this being of water. No feeding experiment was made with this silage.

In the next year, 1885-6, grass was again used, but this, instead of being the inferior park grass, was taken off a very fair pasture from a neighbouring farm. The silage was made in two different ways, the one being "sour" silage, made by putting the grass in at once, load after load, until the silo was filled, and then closing it down and applying the pressure at once. The highest temperature reached in this case was 90° F. The other lot was "sweet" silage, made according to Mr. George Fry's plan, where only a comparatively small amount of green stuff is put in at a time and this is allowed to heat up to 120° F. or so before more is added. The highest temperature reached was 150° F. The relative losses were (a) "sour" silage 5·5 per cent., (b) "sweet" silage 12·66 per cent. Both lots turned out very well and were distinctly different, the "sweet" silage having a very pleasant "plum cake" flavour.

Feeding experiments were again conducted, roots and hay being compared with the silage.

The results were :—

	Sour silage. Gain per head daily. lb. oz.	Sweet silage. Gain per head daily. lb. oz.
Bullocks feeding on silage	2 1	1 7
" " " roots and hay	2 6	1 12½

The roots and hay thus did rather better than the silage. The differences between the results of this experiment and those of the previous year were undoubtedly due mainly to the better quality of the grass now used.

Another silo had been filled in 1884 with oats cut green, chaffed, and siloed. The loss in making was 15·05 per cent. A feeding experiment in 1885-6 with this as compared with roots and oat-straw-chaff gave :—

	1st experiment. Gain per head daily. lb.	2nd experiment. Gain per head daily. lb.
Bullocks feeding on oat silage, nearly	2	2½
" " " roots and chaff.	1½	1½

In a further experiment the oat silage was compared with hay alone, and the results were:—

	1st experiment. Gain per head daily. lb.	2nd experiment. Gain per head daily. lb.
Bullocks feeding on oat silage . . .	1½	1½
„ „ „ hay . . .	1	1

Oats being, as one would allow, the better feeding material, it was not surprising that, as silage also, they proved superior to either roots and straw-chaff or hay. It is worthy of notice that the oat silage had kept quite good for two years, and showed but little loss from moulding, etc.

In 1886-7 the most complete experiment of the series was conducted, this consisting of the taking of a whole field on an adjoining farm and dividing it into two portions, one half being cut green and made into silage, the other half being cut and made into hay in the ordinary way. In each case samples were taken as the silo was being filled or the stack of hay made. Once more a feeding experiment was conducted, this having the special advantage that silage and hay from the same grass were compared; the comparison, further, was not with roots and hay against silage, but as between grass made into silage and grass made into hay. The results were:—

	Gain per head daily. lb.
Bullocks feeding on silage	1.98
„ „ „ hay	1.96

There was, thus, but little difference between the two sets, and, on going into the details of food consumed and the area used in producing this, the general conclusion was reached that:—

2½ acres of grass land made into silage were equal in feeding value to 2½ acres made into hay.

Detailed Tables are given, in the *Journal* (1887), of the composition of the grass, the silage produced and the hay made, also of the respective changes in composition and the losses occasioned with each material. The silage showed a total loss of 7.29 per cent.; of this, 3.27 per cent. were of water; there was little loss in total nitrogen, but albuminoids were partly converted into non-albuminoid bodies (amides, etc.); the woody fibre was lessened in amount, as also the insoluble albuminoids, while the soluble albuminoids were increased.

This work provides a very full contribution to our knowledge of the making of silage, and one which, though mechanical improvements have since been introduced, retains its value as

regards the changes that are produced, the losses that are incurred, and the feeding value of the silage.

The general conclusions may be thus summed up:—

1. Inferior grass may, by the process of ensilage, be utilised and turned into succulent fodder for winter use, but will not have nearly the feeding value of roots and fair quality hay supplying equal dry matter. The value of the product will necessarily depend greatly on the nature of the material used; ensilage may make an inferior material palatable and save it from being wasted, but it will not make good stuff out of bad.

2. When grass of average good quality is made into silage, whether as "sour" silage or as "sweet" silage, it will, as a feeding material, not be fully the equal of roots and hay, but will be only slightly inferior.

3. That oats cut green and made into silage will prove superior, as a feeding material, to roots and oat-straw-chaff, or to hay alone.

4. That an equal feeding return may be expected from $2\frac{1}{2}$ acres of grass land made into silage as from $2\frac{1}{2}$ acres of the same land made into hay.

5. That the total loss in making grass into silage should not exceed 7 to 8 per cent.

6. That silage, when once properly prepared, will keep perfectly well for a second or third year.

VARIETIES OF CROPS.

Trials of different varieties of crops have been intermittently carried on at Woburn; they are noted here under their different headings.

1. *Wheat*.—The following varieties have been grown—1903, three Canadian varieties ("Red Fife," "Preston," "Percy"); 1904, "Red Fife"; 1904 and 1906, "Red Fife" and "Square Head's Master"; 1910, five French varieties ("Treasure," "White Marvel," "Red Marvel," "Sensation," "Dreadnought"), "Little Joss," "Wilhelmina" (Dutch), "Red Admiral"; 1912, three French wheats ("Hatif Inversable," "Jolly Farmer," "Sensation"), "Little Joss," "Wilhelmina" and "Square Head's Master"; 1914, "Svalöf" (Swedish), "Tystofte" (Danish), "Square Head's Master."

Of the Canadian varieties "Red Fife" proved, in each case, the best, and fetched a higher price than the English wheat (36s. per quarter against 32s.), but the yield was lower (26·3 bushels per acre against 29·5 bushels (1905) and 20·2 bushels against 33·8 bushels (1906)).

In 1910 and 1912 the French varieties proved of little use; "Little Joss" in 1910 gave the best quality, but the English

wheat a bigger yield. "Wilhelmina" (Dutch), however, showed the highest produce of all, but the wheat possessed no strength. In 1912 "Wilhelmina" did not do so well, and "Little Joss" was just about as good as "Square Head's Master." In 1914 "Square Head's Master" (29 bushels) proved superior to "Tystofte" (25 bushels) and to "Svalöf" (17 bushels), and also fetched the highest price.

2. *Barley*.—The following were tried:—1899 and 1900, "Archer's Stiff-Straw," "Hallett's Pedigree," "Standwell," "Danish," "Goldthorpe," "Moldavian," "Golden Melon"; 1901, the same varieties with "Burton Malting" additional; 1912, "Archer's Stiff-Straw," "Hallett's Chevalier"; 1914, "Archer's Stiff-Straw," "Svalöf Primus" (Swedish), "Tystofte Prentice" (Danish); 1915, "Svalöf Primus," "Tystofte Prentice," and "Chevalier."

Danish barley, though it did well in 1899 and 1900, was inferior in 1901 to "Goldthorpe" and "Burton Malting," these then doing best. "Archer's Stiff-Straw" in 1912 gave 8-10 bushels more per acre than "Hallett's Pedigree," and in 1914 the Danish "Tystofte Prentice" was as high-yielding as "Archer's Stiff-Straw," both being somewhat superior to "Svalöf Primus."

3. *Oats*.—In 1889 "Cluster" and "American Triumph" proved superior to "New Zealand." In 1901 "Tartar King," "Potato" and "Sandy" oats were grown, the yields coming out in this order. In 1913, "Banner" (Canadian), "Sensation" (Canadian), "Sparrowbill" (New Zealand), and "Abundance" (Garton's) were tried, "Banner" giving 10 bushels per acre more than any other variety. "Abundance" was second best, and the New Zealand variety the worst.

In 1914 the varieties grown were "Svalöf Victory" (Swedish)—37.4 bushels per acre, "Banner"—34.5 bushels, "Mammoth White Cluster" (Canadian)—32.8 bushels and "Newmarket"—32.7 bushels, the "Svalöf Victory" further coming out highest in valuation.

4. *Swedes*.—In 1908 a trial was made of three varieties—"Elephant," "Kangaroo," "Invicta," and of these "Invicta" came out the best, giving about 1 ton more of roots per acre than the "Kangaroo."

5. *Sainfoin*.—From 1900 to 1904 comparative trials were made of four different varieties—two of these being English, viz. the giant and the common, and two French, also giant and common. The English varieties did considerably better than the corresponding French ones, the respective yields of green produce per acre being, for the five crops of each:—

	T.	c.		T.	c.
English giant . .	24	5	English common . .	24	15
French giant . .	11	7	French common . .	17	10

6. *Clovers and Rye-Grasses*.—Trials of these are referred to under "Experiments on Clovers and Grasses" below.

7. *Lucerne*.—Trials of these are referred to under "Lucerne" (p. 140).

8. *Linseed*.—Trials of these are referred to under "Special Crops" (p. 142).

EXPERIMENTS WITH CLOVERS AND GRASSES.

(a) *Duration of Life of Clovers.*

As early as 1883 experiments were started in Stackyard Field on growing different kinds of clover with the object of testing their duration of life, and how far they were affected by manuring. Small plots of (1) Perennial Red Clover, (2) Cow Grass, (3) Alsike, (4) English White Clover, (5) Dutch White Clover were sown in 1883. By 1886 the Perennial Red, the Alsike and, to a large extent, the Cow-grass also had practically disappeared, the English White lasting, the Dutch White also, but hardly so well. One-half of each plot was cut when the clover came into flower, the other half cut when it was in full seeding. It was found that the better produce came from the half cut in the flowering stage, which, no doubt, accounts for clovers lasting longer in permanent pastures.

Of manures tried, nitrate of soda and sulphate of ammonia were fatal to the clovers, and the only material that did any good was sulphate of potash.

The plots were resown in 1886 and trefoil was added. Again it was found that the clovers practically would not continue on the same land for more than three years, owing to "clover sickness." Examination of the dying plants by Miss Ormerod—then Entomologist to the Society—led her to the conclusion that this was due to attacks of eel-worm (*Tylenchus devastatrix*), but, in view of subsequent observations, it is very doubtful whether this supplies a full explanation.

(b) *Varieties of Clover.*

In 1902 Canadian and American varieties were sown, to compare with English; cuttings were taken in 1902 and again in 1903. Over the two years Chilian Red was the best and English Red next best; the other varieties (which included Canadian, Minnesota, Wisconsin, Illinois, Indiana and Oregon) were of doubtful value. In 1905 further trials were made, the clovers sown being Chilian, Canadian, Canadian Mammoth, English Red, English late-flowering Red and Silesian Red. Crops were taken in 1905 and 1906, the English Red proving the best, the two Canadian varieties coming next, and the Chilian third.

(c) Clover and Grass Mixtures (Wild White Clover).

A good deal of attention having been directed about 1910 to "wild white clover," it was resolved to put down in Stackyard Field two plots, one containing ordinary white clover and the other wild white clover, in addition to the grass and other seeds which were common to each lot (perennial rye-grass, cocksfoot, timothy and red clover). These mixtures were sown in 1912 in a barley crop, and crops of hay were taken in 1913, 1914, 1915 and 1916. The respective yields per acre for the four crops were:—

				T.	c.
Mixture with ordinary white clover	.	:	.	9	0
" " wild " "	.	:	.	10	2

More striking, however, than the weights, were the differences between the resulting swards, for the wild white clover gave a close growth of clover of creeping nature, much superior to the other, and providing a much improved grazing area. This would seem to justify the inclusion—even at the higher cost of the seed—of a little wild white clover in any pasture that is going to be kept down for three to four years or more.

(d) Varieties of Rye-Grass.

In 1886 trial plots were started, in Stackyard and Warren Fields, of four varieties of rye-grass, viz. (1) Annual, (2) Italian, (3) Perennial, and (4) Small-seeded rye-grass. These grew on until 1893 by which time they had become impure and were therefore resown, going on until 1898, when, again, they were no longer true.

The general conclusions were that the Annual and the Italian rye-grass soon disappeared, the Small-seeded and Perennial varieties being more permanent in character.

Again, in 1911, further plots of (a) Italian rye-grass, (b) Pacey rye-grass and (c) Dutch rye-grass were sown, the crops of 1912, 1913 and 1914 being taken. Of these, the Italian gave decidedly the highest yield, the other two not differing widely from one another.

EXPERIMENTS ON LUCERNE.

(a) Manuring of Lucerne.

It has often been stated that Lucerne will only grow where there is plenty of lime in the soil. It was decided to try this at Woburn, where the soil is notoriously deficient in lime. The result was to show that lucerne, with suitable manuring, could be kept down on such soil, and without renewing it, giving good crops each year for thirteen years.

In 1889 seven plots in Stackyard Field, where red clover had previously failed, were sown with lucerne and variously manured. These went on well until 1895, giving three to four cuttings a year. Up to that time the manurings did not tell greatly, but, from 1896 on, the influence was very marked, the plots treated with nitrate of soda and with sulphate of ammonia respectively being almost ruined; phosphates used alone did little good, but the plots treated with sulphate of potash and, better still, those with sulphate of potash and mixtures of phosphatic and nitrogenous materials gave very greatly increased yields, and remained quite luxuriant to the time the experiment was closed (1901).

In the spring of 1902 the plots were resown and the manures once more applied. This was continued until 1907, the results being just the same as in the earlier series, and showing the necessity for potash in some form. Each year of this experiment the plots manured with mixtures of phosphates and nitrogen with sulphate of potash gave far and away the highest yields. The actual combinations used per acre were:—Superphosphate 4 cwt., bone dust 4 cwt., sulphate of potash 4 cwt., and either sulphate of ammonia 2 cwt., or nitrate of soda 2 cwt. Hence, though nitrate of soda and sulphate of ammonia, if used alone, destroyed the crop, their combination with phosphates and potash was highly beneficial, the experiment showing, further, that lucerne, with a suitable manuring, could be quite well grown on a soil even when deficient in lime.

(b) *Varieties of Lucerne.*

From 1906 to 1910 a trial of three varieties of lucerne was made—the ordinary Provence, an American and a Canadian variety being compared. The Canadian variety gave considerably the highest return, but, there being some doubt as to the source of the seed, the experiment was restarted in 1911, seed of known origin being then procured in each case. The different varieties were:—Arizona, Canadian, Provence, Turkestan, Russian (European and Asiatic), North American. One half of each variety was sown in a barley crop, and the other half without a covering crop. The experiment was carried on successfully to 1916. The three varieties that singled themselves out as most successful were Russian (Europe), Provence and Canadian—the Russian being best throughout—then, at the outset, the Canadian came next, but finally the Provence proved second best. The Turkestan was a complete failure.

As between sowing with a crop and sowing bare, the latter at first yielded best, but, in the end, there was nothing to choose.

SUGAR-BEET.

Sugar-beet has been grown at Woburn at intervals since 1910, and it has been quite clearly shown there that this crop—and of such size and quality as the manufacturer of sugar would require—can perfectly well be grown in this country. As a rule, the comparison has been one with mangels, and details of relative produce under similar treatment, of sugar contents, of loss in cleaning, etc., have been collected.

In 1910 mangels gave a crop of 31 tons 11 cwt. per acre as against 12 tons 2 cwt. of sugar-beet. The mangels had 6 per cent. of sugar, the sugar-beet 14.53 per cent. (1.82 tons of sugar per acre).

In 1911 selected seed was used, the kinds tried being (1) "Vilmorin's Improved White," (2) "Klein Wanzleben N.," (3) "Klein Wanzleben Z."

Of these, "Klein Wanzleben Z." was somewhat the best; the average produce of all three varieties being 7 tons 10 cwt. of washed roots per acre, containing 15.79 per cent. of sugar (1 ton 4 cwt. sugar per acre).

In a comparison of mangels and sugar-beet the same year (1911) mangels gave 44 tons 4 cwt. per acre of roots (uncleaned) against 23 tons 15 cwt. (unwashed) of sugar-beet. On washing the roots it was found that the mangels lost 13 per cent. of their weight, the sugar-beet about 35 per cent.

An estimate was made that year of the relative cost of growing the two crops, and it was reckoned that the sugar-beet cost £2 an acre more to grow than the mangels.

Another trial on these lines in 1912 gave similar losses in washing (13 per cent. and 30 per cent.), and the sugar-beet then grown contained 17.5 per cent. of sugar.

SPECIAL CROPS.

From time to time new or special crops have been grown at Woburn with the view of finding out if any of them were likely to be worth following up further.

(a) *Lathyrus sylvestris*.—The first of these was *Lathyrus sylvestris*, a forage plant for which a great future was predicted. It was first grown on a small plot in 1888, a larger one being sown in 1890. This grew quite well until 1900, giving each year about 6½ tons per acre of green fodder. By 1901 the plot had become foul and was given up, more especially as it was found that, though it gave an abundant crop, stock could not be got to feed on it properly.

(b) *Gorse* was another crop similarly tried on some very poor sandy land. This was French gorse, sown first in 1897. The

crop came up and grew quite well; it was used in feeding experiments with both bullocks and sheep. But it was found very difficult to bruise the gorse and get it into proper condition for feeding. Bruising it with wooden mallets was tried, and ultimately a "Gorse Masticator" was purchased, but this did the work only imperfectly and at great expenditure of energy. Moreover, after the gorse had been prepared, it was found that sheep could not be got to eat above 1 lb. of it daily. In feeding experiments 1 lb. of gorse was proved to be capable of replacing 2 lb. of swedes, but not to successfully take the place of $\frac{1}{2}$ lb. of hay-chaff. It was found to be best when used fresh cut, and to do better when mixed with hay-chaff than when used by itself.

The difficulty and cost of preparing the gorse proved altogether fatal to its general employment.

(c) *Crimson Clover* (*Trifolium incarnatum*).—This, a new crop to the district, was successfully grown on the farm, first in 1901, it giving then 2 tons per acre of hay. Since then it has several times been taken as an ordinary farm crop. In 1904 the white variety of *Trifolium* was grown as well; this comes to maturity later than the red. It gave at Woburn an almost equal yield of hay to the red, and would be useful for following up the red variety where a succession of crops is desired.

(d) *Soya Bean*.—Several attempts have been made to cultivate this at Woburn, but none have succeeded, the first frost invariably killing the plant before it came to maturity or produced pods with beans. This trial was made in 1912 and continued in 1913 and 1914.

(e) *Gram* (*Cicer arietinum*) was similarly tried but also never matured.

(f) *Linseed*.—This was first started in 1912 and grew quite well. Riga seed was sown in 1913, and in 1914 an experiment was tried (Great Hill) with different varieties, viz. Morocco, Steppe, La Plata and White-flowering Dutch. La Plata was the best, giving 20.3 bushels of seed to the acre, this containing 38.39 per cent. of oil. Morocco seed (19.9 bushels per acre) was next best.

(g) *Maize*.—This was grown in 1894 and in 1897 as a fodder crop. It gave 20 tons per acre of green fodder the first year and 17 tons per acre the latter year.

PREVENTION OF POTATO DISEASE.

The Woburn soil is well adapted to the growing of potatoes, and this crop is usually taken every year.

For just about twenty years records were kept at Woburn of the effect, in preventing "Potato Disease," of spraying the

potato crop with sulphate of copper in the different forms in which it is commonly used, i.e., as "Bouillie Bordelaise," "Bouillie Bordelaise sucrée," "Burgundy Mixture," "Woburn Paste," "Strawsonite," etc.

Many different varieties of potatoes were grown during the period 1892-1911 over which the experiments spread, and most of the suggested ways of application were tried. It is unnecessary to deal with these in detail, as the separate accounts in the *Journal* can be referred to. It will suffice to state the general conclusions come to, as, though not infrequently no disease whatever appeared, it was clear that, when it did appear, the spraying with sulphate of copper and lime, in some form or other, when applied at the right time, was undoubtedly instrumental in greatly checking, if not altogether preventing, the ravages of the disease. Also, even when no disease showed itself, the result of the spraying was to extend the period of growth of the crop and to give an increased yield. With early varieties spraying was seldom necessary, as they ripened, as a rule, before any disease came, but, with main crops, spraying was always advisable. It was found, however, to be of little use to spray after disease had once shown itself.

As between the different applications suggested—both in liquid and in dry powder form—all were found to be beneficial, and, on the whole, nothing answered better than the original "Bouillie Bordelaise" or mixture of sulphate of copper, lime and water, applied by a hand sprayer or by special apparatus fixed to the back of a cart.

This practice is now adopted generally over the farm, whether disease appears or not, and is found to be, in any case, a wise precaution.

"FINGER AND TOE" IN SWEDES.

The poverty of the Woburn soil in lime made it a convenient one for carrying out experiments on the prevention and cure of "finger and toe" in swedes.

An exhaustive series of trials with different materials was commenced in 1896 and carried on successively until 1904. At the outset a large number of substances which had been suggested as remedies were applied, these including sulphate of copper, sulphate of iron, borax, carbonate of soda, bleaching powder, basic slag, kainit, common salt, gas lime, burnt lime, etc. The majority of these were gradually eliminated as they came to prove ineffective in preventing the coming of the disease, or in checking it when once started. The only really effective forms were those in which lime figured. Basic slag to some extent seemed to be beneficial, but it was not the perfect cure that lime showed itself to be. None of the other suggestions proved

in any way of value. From 1900 on, the work resolved itself mainly into the application of lime in the different forms of lump lime, finely-divided lime, carbolised lime, gas lime, etc., and, while finely-divided lime, put on at the rate of 10 cwt. per acre, did quite well, no plan was found more effective than that of giving the land a good dressing of 2 tons of burnt lime to the acre. The adoption of this practice—which has been followed regularly over the farm wherever swedes are to be grown, and the repetition of the liming at intervals, have resulted in swede crops free from “finger and toe” being now regularly grown.

INOCULATION OF CROPS.

From an early date attention was given at Woburn to this new branch, and more particularly after my visit in 1896 to Germany for the purpose of enquiring into the system introduced by Nobbe at Tharand (Saxony). These earlier inoculation media, of which Nobbe's “Nitragin” was an instance, proved, however, unsatisfactory. Then, in 1905, trials were made of new methods put forward by Hiltner (Germany) and by Moore (America). This enquiry was made at the request of the Board of Agriculture, and comprised experiments on peas, beans, tares, red clover, soya bean, and melilotus. But, again, there was nothing tending to show any accrued benefit.

In 1908 W. B. Bottomley took up the subject, putting forward “Nitro-Bacterine” as a new inoculating preparation. This, though tried in 1908 and 1909 on lucerne and white clover in Stackyard Field, proved of no benefit either.

The work was then transferred to the Pot-culture Station (1908 and 1910), and carried on upon lucerne and different clovers, but still without attending success. In 1912 another American method (in which the seed was steeped before sowing) was brought out. It was tried in the field on clover and lucerne during 1912, 1913, and 1914, and, though at first it seemed to give some promise of success, this was not maintained.

In 1914 Bottomley brought out his new peat preparation, “Humogen,” and, to this, extensive trials were given in 1914 on barley, mustard, and peas, in 1915 on oats, mustard, and peas, and in 1916 on barley. The general result of all was the entire failure to prove that any increased nitrifying action was set up. In field work and with grain crops no advantage was found, and in pot-culture work it was only such green crops as mustard that ever showed any gain.

This long series of trials, therefore, though very desirable and necessary from the point of scientific enquiry, failed to show that any of the inoculating methods put forward possessed any claim to practical value.

MANURIAL EXPERIMENTS.

During the forty-five years of the Woburn farm's existence many different manurial experiments were carried out, apart from those comprising the chief work of the station.

These were, however, mostly on other fields than the experimental one—Stackyard Field—and, for reasons already given, there does not attach to them the same accuracy as applies to Stackyard Field trials. They were, however, in each case carried out with every care, and only such are here selected, from the many, as bore the test of scrutiny.

For instance, from 1880 to 1886 two extensive series, with crops in rotation, were carried out on Warren Field and on Lansome Field on the comparative value of soluble and insoluble phosphates. In each case the duplicates showed a want of agreement, and it was felt better not to attempt to draw any conclusions.

Similar failure has already been recorded in the attempt to supplement the Stackyard Field experiments on the unexhausted value of cake and corn by another series in Lansome Field which went on from 1885 to 1903. Many like instances of failure—inseparable from experimental work—might be recorded. To those selected for notice, accordingly, the greater attention may well be given.

(a) Farmyard Manure.

The earliest was in 1889, when, on the conclusion of a feeding experiment with bullocks, the dung produced from the feeding with decorticated cotton cake was compared in its results on a potato crop with that from undecorticated cotton cake. At the same time ordinary farmyard manure was used on another plot, and, on a fourth, artificial manure consisting of superphosphate, kainit, and sulphate of ammonia. The results were:—

	Produce of Potatoes per acre.	
	T.	c.
With dung from decorticated cotton cake	8	13
„ „ „ undecorticated „	7	6
„ ordinary farmyard manure.	7	16
„ artificials	9	9

This was partly repeated in 1903 (also on potatoes), when manure made in the feeding-boxes from high-feeding was compared with that from low-feeding of cake. The results were:—

	Produce of Potatoes per acre.	
	T.	c.
Manure from high-feeding	5	13
„ „ low-feeding	3	19

In each case the higher and more nitrogenous feeding produced a considerably better result than the lower, but it was also brought out that farmyard manure alone would not give as good a return as artificials, in the case of the potato crop.

(b) Potash and Nitrogen for Potatoes.

The question as to whether sulphate of potash or kainit was the better manuring for potatoes was tried at Woburn in 1904 and 1905. Sulphate of ammonia and nitrate of soda were simultaneously tried also.

The results each year were in agreement; 1 cwt. per acre of sulphate of potash proved better than 4 cwt. per acre of kainit, and, while there was little between sulphate of ammonia and nitrate of soda, the balance, on the whole, was in favour of sulphate of ammonia. Cyanamide (Nitrolim) was tried in 1908, but was not the equal of either sulphate of ammonia or nitrate of soda.

(c) Salt for Mangels.

The addition of salt to nitrate of soda as a top-dressing for mangels was tried in 1905, 1906, 1907, and 1908, farmyard manure being used as well in all cases. The addition of 1 cwt. per acre of salt to 1 cwt. per acre of nitrate of soda gave increases over that from 1 cwt. of nitrate of soda alone, of 19 cwt., 5 cwt., 7 cwt. per acre in the three first years. In the fourth year the salt was used in increasing amounts, 1 cwt., 2 cwt., 4 cwt., 6 cwt. per acre, the crop with 6 cwt. reaching the high figure of 41½ tons, a very big crop for the Woburn land. The best results generally were obtained with the use of 2 cwt. per acre of salt added to 1 cwt. per acre nitrate of soda, along with dung.

In 1908 cyanamide (Nitrolim) was tried also, but did not do as well as nitrate of soda.

(d) Nitrogenous Top-dressings for Corn Crops.

The top-dressings used comprised soot, nitrate of soda, sulphate of ammonia, cyanamide (Nitrolim), nitrate of ammonia and nitrate of lime, the crops experimented on being wheat (1905, 1909, 1913), barley (1909 and 1919), oats (1909 and 1910), mangels (1909 and 1910).

In the case of *Wheat*, soot at the rate of 20 bushels per acre gave (1905) 35.1 bushels per acre, and 40 bushels of soot gave 42.1 bushels of corn, as against 34.5 bushels of corn with 1½ cwt. per acre of nitrate of soda (the equivalent in nitrogen of 20 bushels of soot). Twenty bushels of soot cost less than 1½ cwt. of nitrate of soda, and so the advantage rested with the soot. In 1909 nitrate of soda did better than sulphate of ammonia or nitrate of lime, cyanamide being inferior to either. In 1913 nitrate of

ammonia produced 1 bushel more corn per acre than nitrate of soda supplying the same amount of nitrogen.

(2) With *Barley* the results in 1909 were uncertain, but Pot-culture trials in 1919, while showing no great differences between the salts, except that granular Nitrolim proved inferior to the others, gave rather an advantage in favour of nitrate of soda.

(3) *Oats*.—Pot-culture experiments in 1909 and field ones in 1910 with nitrate of soda, sulphate of ammonia, nitrate of lime and cyanamide showed that, if the same amount of nitrogen were put on, the form did not matter greatly.

(4) *Mangels*.—Experiments in 1909 and repeated in 1910 showed sulphate of ammonia not to be as good a top-dressing for mangels as nitrate of soda or nitrate of lime.

(e) *Magnesia for Wheat.*

Extensive field trials on the influence of magnesia on wheat were conducted in the years 1909, 1913, 1914, 1915, 1916, and 1917. It was found that the principal factor was the consideration of the relative amounts of lime and magnesia existing in the soil. So long as the addition of magnesia did not raise the amount of magnesia in the top 6 in. of soil above that of the lime, some advantage followed the employment of magnesia, the crop being stronger, tillering out better, and being of a darker green colour. But as soon as the magnesia exceeded the lime, then a decided lowering of crop resulted. This met with ample confirmation in experiments conducted in the Pot-culture Station. A milling test carried out in 1909 showed that as more magnesia was used the grain became more and more inferior.

(f) *Magnesia for Mangels.*

A trial in 1914 gave 21 tons 12 cwt. of roots per acre when magnesia had been used as against 20 tons 18 cwt. without it. In this case the magnesia (2 tons per acre) had been given to the previous crop (wheat).

(g) *Magnesia for Potatoes.*

The use of magnesia in some form has been advocated for potatoes. In 1908 magnesia itself at the rate of 3 cwt. and 6 cwt. per acre seemed to indicate a benefit, but this was discounted in the repetition of the experiment in 1909 when magnesia in the several forms of magnesia (oxide), carbonate of magnesia, magnesian lime and magnesian limestone was used, a lowering of crop in all cases following its use.

(h) *Leather Powder as a Manure.*

Many attempts have been made to utilise leather waste as a manure, and different methods of treating it, so as to make

its nitrogen available, have been sought, though with but in different success.

Experiments at Woburn in 1919 on swedes, with both natural and treated leather powder, led to no favourable conclusion, and Pot-culture experiments on wheat the same year with like materials also showed leather to be ineffective.

EXPERIMENTS ON LIMING.

In addition to the striking results shown in Stackyard Field on the continuous wheat and barley plots, lime has also been tried in Rotation experiments. Applying, in January, 1908, 2 tons of lump lime per acre in one case, and 10 cwt. of ground lime per acre in another, 41 bushels of barley were obtained in 1908 with the lump lime as against 30.5 bushels with ground lime, and only 24 bushels where no lime had been put on. The wheat crop of this rotation gave, in 1910, 42 bushels per acre with ground lime against 37 bushels with no lime.

In Lansome Field, in 1889, an application of 2 tons of lime per acre did much good, but one of 4 tons per acre effected no further improvement, but rather the reverse.

In 1919, on Series B in Stackyard Field, a very complete series of twelve plots was started in order to compare the respective influences of lime and of chalk. Two plots were left unlimed; five received lime in amounts varying from 10 cwt. to 4 tons per acre, and the other five had chalk instead of lime. Barley was the crop in 1919, swedes following in 1920 and barley in 1921. So far as the experiment went, the indications were in favour of lime being superior to chalk.

Meanwhile a duplicate experiment has been carried on at the Pot-culture Station, wheat being taken each year. The crops have shown a progressive increase with lime up to 3 tons per acre, 4 tons proving rather excessive—as was found on plot 2bb of the Continuous Wheat in Stackyard Field. With chalk, there has been a similar, though not so strongly marked increase, and there is evidence to show that the caustic lime does not, as is generally believed, lose its caustic effect at once.

MISCELLANEOUS EXPERIMENTS.

(a) *Kiln-drying of Barley.*

The influence of kiln-drying barley seed before sowing was tried in 1886, 1899, and 1890, and again in 1906, but in every case with no benefit accruing. It is probable that it is only in an exceptional season that such a measure is desirable.

[Thick and Thin Sowing of Wheat]

A field experiment on sowing wheat at different rates was carried out in 1901, the thinner seeding, one of 8 pecks per acre, proving the best. This experiment was several times repeated at the Pot-culture Station with like result.

(c) Late Pulling of Mangels.

It has been said that it is a mistake to keep mangels long in the ground. To test this, the crop of 1906 was taken up partly on October 10 and partly on November 12. It was found that in the extra month the weight increased from 18 tons 4 cwt., to 24 tons 7 cwt., and, further, that the increase was not due to water, the roots being in no way inferior in keeping qualities.

(d) Absorption of Arsenic by Crops.

A set of experiments was conducted in 1901 on behalf of the Royal Commission on Arsenical Poisoning, the account of which is included in the Report of the Commission. The object was to see whether ordinary farm crops took up arsenic either from manures in which it might occur, or when arsenic was added direct to the soil. The work was conducted on barley and on swedes, and it was found that arsenic did not enter into the matured grain of the corn crop, nor into the bulb of the root crop, but that it might be found alike in the green leaves of the swedes and in the green stalks of the corn crop if cut early.

(e) Manurial Value of Sewage Sludge.

In 1907 and 1908, and again in 1914, experiments on the manurial value of different sewage sludges were carried out for the Royal Commission on Sewage Disposal, the results being set out in the Report of that Commission.

WEED PREVENTION.

Both in the field, and, previously, at the Pot-culture Station, experiments have been carried out on the prevention of weeds. The principal weeds worked on have been :—

Wild Poppy, Wild Oats, Wild Chrysanthemum, Nettles, and Wild Onion.

Spraying with sulphate of copper has been found effective in reducing wild poppy; salt and (better still) kainit have destroyed nettles, and lime, at the rate of 2 tons per acre, has succeeded in keeping down wild chrysanthemum in the field.

The principal work, however, that has occupied attention has been that in finding a remedy for wild onion, a great pest

on heavy land, though not occurring on light land like that of Woburn.

After many attempts made at the Pot-culture Station to destroy wild onion by chemical agencies such as carbolic acid, sulphocyanide of ammonium, and even oil of vitriol, none of these were found effective or practical of application, nor were such methods as deep-ploughing, cutting the heads of the plants off, or even pulling up the bulbs by hand; the wild onion seemed to come again thicker than ever. Attention was then directed, as the outcome of experiments at the Pot-culture Station, to methods for altering the physical condition of the soil, in lightening this, opening it up and so making drainage more complete. It was found, for instance, that if the soil were lightened by putting a layer of ashes or road-drift under it, or by mixing ashes with it, the onions would no longer thrive. Such methods, however, were not applicable on the field scale.

A field of 24 acres at Chelsing, near Ware (Herts), which had been practically rendered useless through the spread of wild onion on it, was offered to the Society in 1902, and, after several trials with different chemicals, I abandoned these and set about ways of altering the mechanical and physical condition of the soil. In this connection I was led to think of Mr. Robert H. Elliot's (Clifton Park, Kelso) system of growing strong grasses (cocksfoot, tall fescue, tall oat grass, etc.) and deep-rooting plants like chicory, burnet, kidney vetch, yarrow, etc., which acted, as he maintained, as "tillers of the soil," opening it out and making it more pervious. In 1904 I had a part of the field put in with Elliot's mixture and another part with lucerne. Good hay crops were obtained from 1905 to 1910, after which the lucerne began to fail. It had been noticed, during the growing of the crops, that the wild onion was very much reduced on the lucerne part, while on the "Elliot" plot there was no onion to be seen. The land was ploughed up in autumn, 1910, and, when turned up, no onion bulbs could be found on the "Elliot" plot, and comparatively few on the lucerne plot, whereas on the rest of the field the onion was as thick as ever.

There is little doubt that the growing of the deep-rooting grasses, clovers and plants had effected the opening out of the soil and the removal of the water, producing a condition of things unsuitable for the further spread of the wild onion.

FEEDING EXPERIMENTS.

In the earlier years, and almost regularly up to 1901, feeding experiments were carried out at Woburn with both bullocks and sheep. After 1901, in consequence of financial difficulties and the uncertainties of prices of purchased feeding materials, these

experiments were, for the most part, given up. From 1912 to 1918, however, a series of experiments on calf-rearing was conducted. For the bullock-feeding experiments the special feeding-boxes erected by the Duke of Bedford were found most useful, and here, as stated, the important experiments which determined the losses in making and storing farmyard-manure were carried out. The calf-rearing experiments were conducted at Charity Farm in the huts and pens specially erected for the Society's inquiry into Tuberculosis in Cattle. All the sheep-feeding experiments were with sheep feeding off the root-crop in the open.

A. BULLOCK-FEEDING EXPERIMENTS.

These took mostly the form of trying one food, or combination of foods, against another, and were carried out on practical lines, rather than with the idea of establishing any theoretical point in feeding, or as bearing on the chemical constituents of foods. The idea was to adopt a system such as the ordinary good practical stock-keeper would use, but to note quantities consumed, gains obtained, etc., and to put these on record.

For a considerable number of years the farmyard-manure used on the continuous wheat and barley crops in Stackyard Field was regularly made in the feeding-boxes, definite amounts of cake, meal, roots, hay, and straw being consumed. The bullocks that had made this were, later on, used for feeding experiments.

(1) *Linseed Cake v. Decorticated Cotton Cake and Maize-meal.*—In this experiment, carried on for three seasons—1878-9 to 1880-1—the feeding values of linseed cake and a mixture of decorticated cotton cake and maize-meal were compared. In each year the mixture of decorticated cotton cake and maize-meal produced the larger increase and at a less cost.

(2) *Cake v. Home-grown Produce.*—The comparative value of cake-feeding and that with home-grown produce was tried in 1887-8 and 1891-2, the cake being either linseed cake (1891-2), or a mixture of linseed cake, decorticated cotton cake and maize-meal (1887-8), the home-grown produce being beans, oats, and barley or else wheat, oats and barley. In such comparisons a determining factor is, of course, the prices of the different foods at the time, and the variability of these tells against the applicability of the results at another time when the respective prices may be very different.

In the first series the greater gain of weight was with the cake-feeding, in the second the gains were much alike, the cake-fed animals, however, "killed" better than those fed on home produce.

At a later date (1901-2) this experiment was repeated, when

a mixture of linseed cake, decorticated cotton cake and maize-meal gave a daily gain per head of 2.38 lb. as against one of 1.93 lb. with beans, oats, and wheat. The feeding with home-grown produce took longer and so cost more, though the meat was better, the cake-feeding giving rather excessive fat.

In yet another and earlier trial (season 1894-5) cake (linseed cake and decorticated cotton cake) was partly replaced by home-grown wheat and barley. The gains of both live-weight and dead-weight in the two sets were much alike; the entire question of economy turned, therefore, upon the respective prices of the cereals and the cake. If the price of home-grown produce was low, it was feasible to economically reduce the cake bill by the use of wheat and barley in part substitution for cake.

(3) *Decorticated v. Undecorticated Cotton Cake.*—The comparison of decorticated and undecorticated cotton cake was made in two different seasons, 1888-9 and 1890-1. The respective gains per head daily were :—

	1888-9.	1890-1.
	lb.	lb.
With Decorticated cotton cake . . .	2.21	2.38
„ undecorticated „ „ . . .	1.97	1.84

A decided advantage thus followed the feeding with decorticated cake, and if manurial values also were taken into account this would be still greater.

(4) *Cake replacing Hay.*—In 1889-90 the experiments took the form of seeing how far cake might replace hay. The cake-feeding (with linseed cake and decorticated cotton cake) was of two orders—high-feeding and low-feeding. The high cake-feeding gave a daily gain per head of 3.12 lb., the low cake-feeding one of 2.54 lb., and feeding with no cake but with hay used freely, 1.36 lb. only. The high-feeding with cake was found to be the most economical, and that with hay and no cake the least so. The bullocks in the hay lot consumed 16 lb. a head daily of hay.

(5) *Earth-nut Cakes.*—Earth-nut (ground-nut) cake was tried in 1891-2 in conjunction with the cake and home-grown produce experiment of that season, and was found to be as efficient as beans.

(6) *Dispensing with Roots.*—The attempt was made in 1893-4 to dispense with roots. Roots and straw were given as against straw with linseed oil poured over it, but the latter feeding did not answer at all, and it had to be altered to supplying an equal amount of oil in linseed cake. This set of bullocks then improved, but never became the equal of those having roots, so that the attempt to replace roots was not successful, and roots were practically found to be indispensable.

(7) *Economy in Root-feeding*.—Economy in the feeding of roots was first tried (1895-6 and 1896-7). The roots were kept down to 35 lb. a head daily in one case against 50-56 lb. in the other, the difference being made up to the lighter feeding by hay and straw-chaff. The result in each season went to show that, while the heavy root-feeding did rather the better, there was no marked difference in the respective gains, so long as the same amount of dry matter was given. Hence, when roots are scarce they may be economised without much loss, but when plentiful it is advisable to use them freely.

(8) *Dried Grains v. Hay*.—An experiment in the season 1897-8 had for its object the seeing whether dried grains would successfully replace hay in feeding. It was found that, while this could not be done entirely, the partial replacement of hay by dried grains could be carried out to advantage.

(9) *Early Feeding of Mangels*.—The early feeding of mangels to bullocks—i.e., previous to Christmas—is believed to be inadvisable. The swede crop of 1898 being short and mangels plentiful and well-matured, the latter were fed early to bullocks, which had, severally, undecorticated cotton cake, bean meal, and hay in order to prevent any possible scouring. The mangels were fed from December 1, 1898; 28 lb. per head daily were taken at first without trouble, but 35 lb. proved too much. Hay was found ineffective in stopping scouring, but both undecorticated cotton cake and bean meal succeeded in this respect, and, gradually, the animals were worked up to take 40 lb. and then 45 lb. of mangels per head daily, and did quite well.

(10) *Use of Condiments, etc.*—The use of additional flavouring and condimental foods for bullocks was tried in the season 1900-1, locust-bean, spice, and molasses being then tried. It did not appear, however, that, when good ordinary foods were used, there was any case made out for the inclusion of "appetisers" of such nature as tried, nor was their employment found to enable more straw-chaff and other bulky food to be taken.

B. SHEEP-FEEDING EXPERIMENTS.

(1) *Malt v. Barley*.—Barley and malt as foods for sheep were compared in 1882-3, and at the same time pea meal was also tried. Each set received linseed cake as well, with swedes and hay and straw-chaff. Malt proved rather better than the same quantity of unmalted grain, though the difference was not great, and the mixture of pea meal with linseed cake was better than that of either the malt or the barley with linseed cake.

This experiment was repeated in 1891-2 with some modifi-

cations, one lot of sheep now having linseed cake alone as additional food, a second lot having linseed cake and barley, and the third linseed cake, barley, and malt. The respective gains per head daily were:—

With linseed cake	lb.
" " " and barley	53
" " " barley and malt,	46
	47

At the respective prices the feeding on linseed cake alone was the most profitable, and the addition of malt to barley did not repay the cost.

(2) *Cake v. Home-grown Produce.*—Home-grown foods as against cake were tried in 1885-6, and again in 1886-7.

In 1885-6, wheat, used whole, gave a slightly better gain than linseed cake, and was superior to oats and barley-meal mixed, it being also, at then current prices, the most economical feeding. When, however, in 1886-7, decorticated cotton cake was added to the foods tried, the gain with its use was decidedly the highest and obtained at the lowest cost. Wheat stood second, and, as in 1885-6, was slightly superior to linseed cake. The use of barley-meal as an addition to either linseed cake or decorticated cotton cake carried no advantage with it.

A further experiment in 1887-8 in which only home-grown foods were used, confirmed the superiority of wheat, while between oats and barley, or a mixture of the two, there was little to choose.

In a later experiment (1894-5) the *partial substitution of linseed cake by wheat or barley* was tried, linseed cake and barley proving rather better than linseed cake and wheat, or than linseed cake alone.

(3) *Heavy-feeding v. Light-feeding.*—The heavy-feeding of cake and corn as against light-feeding of these was a subject of experiment in 1893-4, 1 lb. of a mixture of linseed cake and barley being given as against 60 lb., the conclusion being that the steady feeding with moderate amounts was preferable.

(4) *The Use of Fibrous Foods for Sheep.*—In a second portion of the foregoing experiment the effect of *adding hay* to a ration was tried. Linseed cake, barley, roots, and hay were given in one case, and, in the other, the same foods but with hay omitted. The addition of hay proved both advantageous and economical. This experiment, at the suggestion of Sir John Lawes and Sir Henry Gilbert, was repeated in 1895-6 with some modifications.

In this new series linseed cake and barley were used in each case; in two out of the four lots hay was given in addition, in a third, oat-straw chaff and barley, and in the fourth, dried grains. The result was to show the need of using a fibrous

material like hay or dried grains when feeding sheep on roots, and that, of the fibrous foods tried, dried grains gave the best result and then hay-chaff. Incidentally it came out that the giving of proportionately heavy amounts of cake and corn did not materially reduce the roots and chaff eaten; and also that it was not advisable, in the case of an "open" winter (such as 1895), to feed barley freely.

The experiment was yet further developed in 1897-8, when the following were tried one against the other: (a) Oat-straw chaff, (b) meadow-hay chaff, (c) meadow-hay chaff and oat-straw chaff, (d) dried grains. Of these, meadow-hay chaff and oat-straw chaff came out best, then dried grains, meadow-hay chaff following close, and oat-straw chaff doing worst. This experiment showed, further, that, with sheep, one can replace hay with dried grains, whereas with bullocks this was not found to be successful.

(5) *Early Feeding of Mangels*.—Following the lines of a similar experiment in bullock-feeding, the early feeding of mangels to sheep was tried in the winter 1898-9. From December 20, mangels were used entirely in place of swedes. It was found that, if $\frac{1}{2}$ lb. per head daily of undecorticated cotton cake was given, there was no scouring whatever experienced.

This experiment was repeated in 1900-1, the feeding with mangels beginning at an even earlier date, viz., November 9. The experience was the same, and the sheep did better in this early period on mangels than they did on swedes.

(6) *Feeding of Gorse*.—In 1898-9 the attempt was made to replace swedes by chopped gorse. The difficulties connected with the preparation of gorse as a food have been already referred to: when it came to feeding with it, it was found that the sheep would not take over $2\frac{1}{2}$ lb. a head daily, and that this would not replace more than 6 lb. of swedes. Sheep fed on swedes without gorse gained .31 lb. per head daily, with swedes and gorse as well, .377 lb. The sheep fed on gorse did, however, very well throughout, and produced the better meat when killed.

Gorse was tried again in 1900-1 and in 1901-2 with results very similar to those just described.

(7) *Economy in Root-feeding*.—Lastly, in 1901-2, the limiting of the root ration was tried. In one case a full supply (15-20 lb.) of roots was given; in a second, the roots were limited to 10 lb. per head daily; and in a third, no roots at all were given, but hay with treacle and water poured over it was given instead. The experiment clearly showed that the last-named feeding would not do, and that root-feeding could not be dispensed with; also that the giving of 15-20 lb. of roots per head daily was better than limiting the ration to 10 lb.

CALF-REARING EXPERIMENTS.

As mentioned earlier, on the conclusion of the tuberculosis experiments, the 55 acres of Charity Farm, with the special sheds and pens erected there, were available for use, and, considerable experience having been gained in the rearing of calves, it was thought well to carry on this work, and chiefly with the view of seeing how far the use of whole-milk could be dispensed with. Every one knew that calves could be best reared on whole-milk, but equally true was it that this was expensive feeding.

(1) The first series of experiments, 1912-14, accordingly took the form of seeing how separated milk could best be utilised, and how far it might, with suitable addition, take the place of whole-milk.

The calves, it should be said, were not born on the farm, but were purchased in the market when three or four days old, brought to the farm, and then hand-fed, so that they only had their mother's milk for the first few days of their life. The general plan of feeding adopted was to give them whole-milk for the first fortnight, and then to gradually reduce this with separated milk until separated milk with some additional food entirely replaced whole-milk.

In this first experiment there were five lots of calves; one lot had whole-milk; a second lot, a purchased calf meal; a third, separated milk with cod-liver oil; a fourth, separated milk and a gruel of linseed and oatmeal; and the fifth, separated milk with crushed oats.

When the period of the special feeding (which generally lasted from ten to fourteen weeks) concluded, it was found that the greatest gain in live-weight had been obtained by the separated milk and crushed oats, the next highest by whole-milk, though this feeding cost a great deal more. The calves were then turned out and all fed alike, being kept on until they were ready—in 1914—to go to the butcher, when the live-weights were again recorded. The result was the same as at the earlier period, viz., the bullocks that had been reared, as calves, on crushed oats and separated milk gave the highest gain in live-weight and at the lowest cost.

(2) A second series was started in 1913 and continued to 1915. The animals were fattened off and sold. The feeding was similar to that of the 1912-14 experiment except that two other feeds were tried, and not one only, but in neither case did the results answer well. The general conclusions were fully in accordance with those of the earlier experiment, crushed oats and separated milk giving the highest gain and at the lowest cost per lb. of increase. Whole-milk, as before, came out second best as regards live-weight gains, but was much dearer feeding.

(3) In a third series, which extended over 1915-17, crushed oats and separated milk were again used; but other foods, such as palmnut meal, maize, beans, etc., were used with water in place of separated milk. Again the crushed oats and separated milk gave the highest gain. Considerable difficulty was found with feeding palmnut meal, but when this was eventually managed, the palmnut meal did well and came out the cheapest feeding, crushed oats with water in place of separated milk not being so successful. The experiment showed that it was possible to replace separated milk by water, but only at a lower gain in live-weight.

(4) A fourth experiment was made, 1916-18, this being practically a repetition of the last-named, but using water only and a mixture of foods instead of single foods. This experiment indicated that the use of a mixture of foods was preferable.

The experiments generally led to the conclusions (1) that it was only necessary (and advisable) to feed with whole-milk for the first fortnight, (2) that, subsequently, separated milk could be used instead, and that the best addition to it was that of crushed oats, (3) that when separated milk was not available, water might be used instead, though not to such advantage, (4) that gruels or calf meals were not necessary; but that, when water was used, a mixture of foods was preferable to employing single foods.

The account of these experiments is given in *Journal R.A.S.E.*, 1917, pp. 248-260.

(5) In subsequent work—when employing water in place of separated milk—the form of feeding found most successful was the use of linseed cake ground fine and made up with warm water into a gruel which was fed to the calves from buckets provided with tubes ending in a “feeder” consisting of an india-rubber teat. The calves, from quite an early age, took readily to this form of feeding, which imitated the natural one of sucking, and no difficulty whatever was subsequently experienced, and the calves thrived capitally.

POT-CULTURE STATION.

The last section that deals with the work at Woburn has reference to the Pot-culture Station. This was established in 1897, being, primarily, the outcome of a bequest from the late Mr. E. H. Hills. Mr. Hills left, in 1896, £10,000 to the Society, for the purpose of carrying out experiments on the value, in agriculture, of what he termed “the rarer forms of ash,” indicating under this term such constituents as “fluorine, manganese, iodine, bromine, titanium, and lithia.” An account of the establishment of the Station—the buildings, equipment,

etc.—is given in *Journal R.A.S.F.*, 1900, pp. 553-605. The Station covers a quarter-of-an-acre of ground and comprises a glass-house, wire-enclosure, laboratory, store-room, and office. The experimental crops are grown in pots (earthenware and zinc) placed on trucks which are run along rails laid down the length of the glass-house and wire-enclosure, so that the plants can be kept under cover or run out into the open as desired. Though originally intended for the Hills' experiments, the work done at the Station has included a wide range of other subjects of inquiry, notably such as were the outcome of the field experiments. Matters of general agricultural interest have also been taken up, new materials tried, etc. Already, in the preceding pages, there has been frequent reference to work at the Station, running concurrently with, and supplementing or explaining, the field experiments. Altogether, the Station, with its laboratory, has proved a most useful adjunct to the field work.

It will be fitting to deal first with what may be more specially termed the "Hills' Experiments," and it will be seen that already a much wider sphere than Mr. Hills perhaps contemplated has been traversed, the materials tried comprising many metallic compounds, which, speaking generally, have been found to possess, on the one hand, a stimulating and, on the other, a toxic influence, according to the quantities in which they are supplied. These will now be briefly dealt with:—

After a preliminary trial in 1898 and 1899 with various materials indicated by Mr. Hills, and on different crops, with a view of selecting some for fuller inquiry, the regular investigations started in 1900 with compounds of Lithium.

The methods pursued here were typical of those followed in other cases. Beginning with a comparatively large amount, the effect was watched and, if found to be harmful to the plant, the application was successively reduced in later experiments until a point was reached at which it ceased to be toxic and to possess, possibly, a stimulating influence. In this way the limit for the profitable employment of any particular compound was sought to be ascertained. It was found convenient to state all quantities in terms of the element in question, and the amount given was reckoned as that present in 100 parts of the soil in which the plants were grown. Wheat was found to be the most suitable crop, generally, for experimenting with, and, when no other is specially stated, it may be taken that the reference is to the wheat crop.

1. LITHIUM.

The experiments with compounds of lithium extended over nine years between 1900 and 1912. After finding that .05 per cent. of lithium and larger amounts were harmful to wheat and

barley, retarding germination and reducing the yield, .0075 per cent. and .00375 per cent. were successively tried with like effect, and, eventually, in 1909, a point was reached when a toxic influence was no longer shown, this being at a concentration of .0018 per cent. This covered work with the oxide, chloride, sulphate, carbonate, and nitrate, and it may be concluded, therefore, that if the salts be used in quantity not to supply over .002 per cent. of lithium, no injurious effect will be found, but that if lithium be present to the extent of .003 per cent. or over, harm will result.

The work was extended in 1910-12, lithium in smaller quantity (.001 per cent.) being found, when used as the phosphate, carbonate, or nitrate, to have a stimulating influence, more especially the nitrate.¹

2. MANGANESE.

Experiments with salts of manganese in 1902 and 1904 gave no marked results. No harm was done to wheat or barley. In 1913 manganese up to .10 per cent. was applied without any effect.

3. IODINE AND BROMINE.

Preliminary experiments in 1899 showed the soda salts of these—especially of iodine—to be very harmful, and work in 1903 with iodides of sodium, potassium, lithium and manganese gave like results, an application of 1 cwt. per acre being injurious to wheat and to barley.

4. CÆSIUM.

Compounds of this were used in 1909 and, at the rate of .0036 per cent., were found to have no harmful nor beneficial influence.

5. CERIUM.

This, though used in different compounds up to .01 per cent. showed, in 1913, no effect.

6. ZINC.

Experiments with this began in 1909 and were continued in 1910 and 1913. Zinc was found to be toxic above .02 per cent., but stimulating at .01 per cent.—the oxide, chloride, sulphate, phosphate, nitrate, and carbonate being used.

¹ *Note.*—In this, as in practically all other cases where different compounds were used, it was the more soluble ones that showed the more marked, and the insoluble ones the lesser, action. Thus, a larger amount of an insoluble salt might be used than of a soluble one, without proving toxic. The results are, however, given here as for the more active compounds.

Lead in its various compounds was found, in 1912, not to be hurtful at .03 per cent., and increase of the amount used showed, in 1914, that .10 per cent. was not toxic either.¹

8. COPPER.

Sulphate of copper and carbonate of copper were tried in 1913. In amounts less than .01 per cent. no influence was seen; when above this and not exceeding .02 per cent. a stimulating influence was found; over this amount a toxic effect was produced, .10 per cent. being absolutely destructive of the whole plant, and .05 per cent. nearly so. Experiments in 1914 with a wider range of salts generally confirmed the above, but showed that there was considerable difference between the different compounds, the sulphate, carbonate, nitrate, and arsenite being harmful at .05 per cent., but more or less safe at .02 per cent., while the phosphate, used up to .10 per cent., did no harm.

9. STRONTIUM.

In 1915 the sulphate, carbonate, and hydroxide of strontium showed no effect on wheat up to .10 per cent., but the chloride retarded germination and showed a toxic influence as .10 per cent. was approached.

10. BORON.

An interesting series of experiments with boric acid and borax on both wheat and barley was carried out in 1915. With wheat, .005 per cent. of boron was absolutely fatal to the crop, while as little as .001 had an injurious effect, this being the more marked with borax. .0005 per cent. was the most that could be safely used, and this concentration was slightly stimulating.

With barley, .001 per cent. was found to be destructive, and .00025 per cent. was the most that could be used.

In 1919 these experiments were repeated with barley, and generally confirmed the earlier work, showing that anything above .001 per cent. of boron would injure the crop, while .003 per cent. of borax would kill it.

11. SODIUM.

Many salts were tried in 1916; the hydroxide, carbonate, and sulphate could be used up to .20 per cent. without harm, but the two former produced a distinct "caking" of the soil.

¹ Note.—At a later date than the close of this record it was found (1922) that lead when present as chloride exerted a harmful effect when the quantity exceeded .25 per cent., but that in the forms of oxide, carbonate, sulphate no toxic result followed the use up to 1 per cent. of lead.

The chloride was harmless up to .10 per cent. (1 ton per acre), but, if used above this amount, it affected the plant (wheat), and at .20 per cent. quite destroyed it.

12. BARIUM.

The hydroxide, carbonate, and sulphate of barium proved harmless up to .20 per cent.; the nitrate at .10 per cent. was injurious, and any greater amount than this destroyed the crop (wheat); the chloride was harmless if not exceeding .05 per cent., but was toxic in larger amounts.

13. IRON.

Sulphate of iron was first tried in 1904 without any marked result, and the work was repeated in 1918, other salts being also used. With the exception of the chlorides, they showed little influence, but ferrous chloride gave a beneficial result if used not exceeding .1 per cent.; beyond this figure it was harmful. Ferric chloride was found at .2 per cent. to entirely prevent the growth of wheat.

14. ARSENIC.

Following the work done for the Royal Commission on Arsenical Poisoning in 1900 (*see* page 149), arsenious and arsenic acid and also their soda salts were experimented with in 1919. The toxic effect was found to depend largely upon the solubility of the materials; thus, the insoluble arsenious acid could be used without harm up to .10 per cent., while with the more soluble arsenic acid, or the soda salts of either acid, not above .02 per cent. could be used. A safe limit might be put at .01 per cent. ($8\frac{1}{2}$ cwt. per acre).

15. TIN.

Compounds of tin were tried in 1920 on wheat. These seemed to have no direct action, any differences being due rather to the acid radical than to the metal itself. Thus, stannic chloride could be used up to .05 per cent., but .10 per cent. was toxic.

16. CHROMIUM.

Chromate and bichromate of potash were tried on barley in 1920 and found to be toxic at .005 per cent. of chromium in either form. On continuing these same pots with wheat in 1921 and without any further addition, while .025 per cent. still remained harmful in the second year, the application of .01 per cent. the previous year had spent its ill-effect and was now slightly stimulating. A new set started on wheat in 1921, with chromic acid additional, showed .005 per cent. of chromium

to be toxic, but that when less than .005 per cent. was given, a stimulating effect was produced with all, including chromic acid.

17. RADIO-ACTIVE ORES.

Experiments with ores stated to be "radio-active" and containing about .15 per cent. of uranium oxide, were tried in 1916, but the ores were found to be without any stimulating effect whatever on wheat.

18. SULPHUR.

In 1913 the effect of using flowers of sulphur was tried on mustard, red clover, and rape, but in no case was any benefit seen. This was repeated in 1920 on mustard, red clover, and lucerne, but again without result.

19. SILICATES.

In 1904 silicates of potash and soda were tried on wheat and barley with some promise of success, but the subject was more fully gone into in 1920 and 1921. In 1920, silicates of lime, magnesia, and alumina were used, and, while the two latter showed no advantage, the use of 4 tons per acre of silicate of lime gave with wheat a marked increase. This seemed to indicate that carbonate of lime in a soil is not the only thing that counts, but that the lime present as silicate is also of material import. These same pots, without further addition, were kept on for 1921, when, again, calcium silicate—used up to 4 tons per acre—showed benefit. Magnesium silicate was slightly beneficial, but kaolin not at all so.

20. FLUORIDES.

Calcium, potassium, and sodium fluorides were tried on wheat in 1921, also silico-fluoride of calcium. The calcium fluoride and silico-fluoride had no effect, but potassium fluoride containing .05 per cent. fluorine produced considerable increase of crop, and .10 per cent. fluorine a still greater gain. Sodium fluoride, however, with .10 per cent. fluorine entirely prevented the growth of any crop; the soil became of a brownish-black colour and was hard and caked on the surface, so that nothing would grow. It showed a great contrast to the soil with potassium fluoride, which remained in a fine state of division. With .05 per cent. fluorine, sodium fluoride, while giving something of the same "caking," etc., and retarding the crop, eventually produced a marked increase in it, one about equal to that of .10 per cent. fluorine as potassium fluoride.

This difference of behaviour between salts so generally alike as potassium and sodium fluorides is very remarkable.

21. FELSPAR, PHONOLIT, AND LEUCITE.

In the search for new sources of potash, the need of which was much accentuated during the War, attempts were made to utilise minerals known to contain potash. Felspar and phonolit were tried in 1911 and 1912 and again in 1915, but without any benefit being noticed on wheat. The same was the case in 1916 with red clover, but, on carrying this on to a second year, without further application, felspar seemed to tell slightly. Tried again on mustard and barley, felspar did no good the first year.

When, however, the new introduction, leucite (a potassium aluminium silicate), was tried in 1921, this produced with wheat a marked benefit. The leucite contained 16 per cent. of potash and was found to be to a considerable extent soluble in hydrochloric acid. The gain from its use at the rate of 5 cwt. per acre was very much the same as that from sulphate of potash supplying a like amount of potash.

22. NITROLIM AND DICYANODIAMIDE.

The question as to the possible harm to crops arising from the presence in nitrolim (calcium cyanamide) of dicyanodiamide, having been raised, experiments on this subject were carried out in 1916 and 1917. Ordinary nitrolim, granular nitrolim, and dicyanodiamide itself were tried on wheat. The granular nitrolim was found to contain a certain amount of the polymeric form dicyanodiamide, which was not present in the ordinary nitrolim. The results in 1916 indicated some failure of crop with dicyanodiamide, and that the granular nitrolim was not as good as the ordinary. In a repetition, in 1917, on barley and mustard, there was distinct evidence of dicyanodiamide, when used at the rate of 1 cwt. per acre, doing harm, and, as before, of the ordinary nitrolim being preferable to the granular. Second and third crops of mustard were grown, and the several materials used in increasing quantities, 1 cwt., 2 cwt., and 3 cwt. per acre. Three cwt. per acre of any of them was found to be excessive and to do harm, and it was clear that not more than 2 cwt. per acre could be safely used.

23. NITRE-CAKE AND NITRE-CAKE SUPERPHOSPHATE.

During the War, through shortage of oil of vitriol for making ordinary superphosphate, nitre-cake was employed in its place. On trying it alone or made into superphosphate, no injury to the wheat crop from the use of either material was found.

24. MAGNESIUM CHLORIDE AND SULPHATE.

An experiment in 1916 showed that, with wheat, magnesium chloride up to 10 per cent. of magnesium could be used, but

that above this amount the crop would be injured. With sulphate of magnesium, however, this could be used safely up to 40 per cent. of magnesium.

The foregoing comprise the experiments on constituents not ordinarily entering, to any considerable extent, into the composition of soils, but which, under special conditions, might be present, and the influence of which, when so present, it was desirable to know. The remaining experiments, in addition to those already recorded under green-manuring, etc. (see page 124), are such as have arisen in connection with the Field Experiments.

25. ACID SOIL.

The soil of plot 2a (ammonia salts) of the continuous wheat experiment in Stackyard Field was, in 1916, treated—with the view of correcting the acidity—with lime and with carbonate of lime (chalk) in varying amounts ranging from 1 ton to 4 tons per acre of lime, or its equivalent in carbonate of lime. Wheat was the crop. It was found that with lime there was a successive increase of crop up to 3 tons per acre, but that 4 tons per acre did not do so well. This had been similarly found to be the case in the field. With carbonate of lime the increase was more regular, though not so marked as with lime; also 4 tons per acre of lime in this form did not do the harm that 4 tons of caustic lime caused. A continuation of this in 1917, also on wheat, but using no more lime or chalk, gave the same results as before. There was, thus, clear evidence that lime and chalk do not act alike, but that lime is the more active and retains its causticity for some time.

26. FEN SOILS.

Experiments on fen soils were carried out in 1908. Though these soils are, as a rule, very rich in nitrogen, the nitrogen is not readily available, and it was found that readily available nitrogen and minerals could with advantage be used on them. Further, that lime was not necessarily a remedy, many of the soils, indeed, being quite well supplied in lime.

27. LIME AND MAGNESIA IN SOILS.

Perhaps the most important set of experiments conducted at the Pot-culture Station is that concerned with the relative proportions in which lime and magnesia occur in soils, as bearing on their crop-bearing powers. Field work on this subject has been already referred to (page 147), and the following experiments were in furtherance or explanation of these results.

The first start was made in 1906, when wheat grain, grown with magnesia added to the soil, was found to become more glutinous

and richer in nitrogen. This was followed by experiments continuously conducted from 1907 to 1915 not only with the Woburn soil (which contains relatively little magnesia), but with a Hereford soil in which magnesia was present in greater quantity than lime.

The general intention was to treat the Woburn soil with increasing quantities of magnesia until magnesia was in excess of lime—the original percentages present being, lime .40 per cent., magnesia .20 per cent.—and to treat the Hereford soil—which originally had, lime .83 per cent., magnesia 2.29 per cent.—with increasing quantities of lime.

It will suffice to state here the general results. In the case of the Woburn soil it was found that as magnesia was added in increasing amounts the crop (wheat) at first was slightly increased, this remaining so as long as the magnesia did not equal the lime present. But when the relative proportions became alike, a decrease of crop began, and this decrease went on until magnesia came to be in distinct excess of lime, and then entire failure of crop ensued. With the Hereford soil, on the other hand, as lime was added the crop increased, and even when an excess of lime was present there was no failure of crop such as was found when magnesia was added in excess of lime to the Woburn soil.

The experiments were carried on, without further addition of lime or magnesia, for a second, third, and fourth crop, and the same results were found. Barley, clover, and beans were similarly tried, and with like results. It was noticed that the root development was greatly modified by the addition of magnesia, and also that the wheat grain became more glutinous and richer in nitrogen as more magnesia was used. On the other hand, after taking glutinous wheat grown with added magnesia, and growing it in soil having lime in excess, it altered its character and again became more starchy.

28. "SMUT" IN WHEAT.

Trials were made in 1899 and 1902 of different methods suggested for treating seed wheat to prevent attack of "smut." Sulphate of copper and various preparations commonly sold were tried, but none was found more effective than Jensen's hot-water treatment, in which the seed is steeped for 10 minutes in water at 133° F.

29. "HARD" AND "SOFT" WHEAT.

As the outcome of experiments on different classes of soil, it was found that the sowing of "hard" wheat did not necessarily result in the production of "hard" grain, or *vice-versa*, but that the general tendency of heavy land was to produce a

more glutinous grain, though only "soft" wheat had been sown; and that light land tended to produce a more starchy grain, whether "hard" or "soft" seed had been used.

30. "HEAD" AND "TAIL" CORN.

Here, again, it was found (1898, 1901, 1902, 1903), with both wheat and barley, that, so long as the grain was not broken or chopped, large, plump seed did not necessarily produce like grain, nor did small grain necessarily produce inferior grain.

31. METEOROLOGICAL WORK.

As a Recording Station—of the "second order"—of the Meteorological Office, the Pot-culture Station has, since its establishment in 1898, continued uninterruptedly to supply to the Office daily records of Rainfall, Temperature, Dew-point, Sunshine, etc.

Such is the account, necessarily a condensed one, of work which the Woburn Experimental Station has carried on for forty-five years. The detailed accounts of each experiment will be found by reference to the *Journals* of the Society.

J. AUGUSTUS VOELCKER.

1 Tudor Street, E.C.4.

RESEARCH WORK BY THE SOCIETY IN 1923.

I.—EXPERIMENTS WITH CEREALS IN NORFOLK.

NORFOLK has long been famous for the high quality of its malting barleys, and it is perhaps natural that it should be selected by the Research Committee of the Royal Agricultural Society as a suitable centre in which to encourage this branch of agriculture.

Experiment both in the growing and testing of new varieties and a plan for the growing on of the pure seed of varieties already approved were envisaged in the scheme laid before the Committee by the Norfolk Agricultural Station and carried out on an experimental farm near Norwich.

The Station is an institution which was started some fifteen years ago by the landowners and farmers of Norfolk for the good of their own agriculture and which, with an interval just after the war, has grown steadily in aims and achievement until it has become the recognised centre for agricultural experiment in the county.

The expenses attendant upon agricultural experiment and

pure seed production are always considerable and in this case they were met by a substantial grant to the Station from the funds of the R.A.S.E.

As has already been indicated the undertaking was divided under two heads: (1) experiment and research (2) pure seed production, and in describing the operations it is proposed to treat them separately.

Variety yield trials at once suggest themselves as a necessary part of comparative experiment with cereals, and an interesting set of plots was designed and set out.

Great difficulties are always encountered in this type of trial in obtaining identical conditions for each of the plots which are to be compared. This fact can be readily appreciated by any one who has had reason to study the almost infinite variations of soil and situation, in fact by any practical farmer.

It is impossible in field experiment to obtain that precision of conditions which prevails in a laboratory, and whatever measures may be taken there must always be a considerable allowance made for error. The existence of this inevitable error makes it all the more necessary for experimenters to adopt those methods which promise to reduce it as much as possible, and by which they may hope to arrive at results which are reliable.

In the case of variety yield trials with cereals two measures can be taken which together tend to produce results that are really valuable. The first of these is comprised in the design of the plots themselves, and the second in the statistical methods which are employed in the treatment of results obtained in the same experiment at a number of different centres.

In the trials under consideration it was decided to use four new varieties of barley in conjunction with a single standard variety, with which all were comparable, and to sow the corn in half drill strips on the system recommended by Dr. E. S. Beaven and used by him with great success for a number of years.

The preparation of the seed beds and the actual operations of drilling were hindered to some extent by the unfortunate strike of agricultural labourers which occurred in March last year, but with the aid of good fortune and a willing spirit, an amateur team was able to execute the work.

The method consisted in dividing an ordinary cup drill into two equal sections, one of which was filled with the seed of the standard, and the other with that of the variety under test.

In order to make a division on the ground between these, the two centre coulters were put out of action, and when all the others have been carefully spaced drilling is begun and carried out in the ordinary way.

The result was that a number of narrow strips of the two

varieties were sown side by side, and it is fair to suppose that the variations of land and situation were nearly equally divided between them.

At the end of each set of strips, in this case after five rounds, the drill was carefully cleaned to prevent the varieties from becoming mixed, and was a slow and laborious business.

The half drill plots as they grew up were kept clean by hand labour, as any considerable growth of weeds would tend to be unequal over the whole area and to upset the accuracy of the results.

As the time of harvest approached it was observed that one of the barleys would be ripe some ten days before the rest and this brought out what must be considered as a serious limitation of the system.

It was not feasible to cut the one plot separately from the rest without seriously disturbing the balance of the experiment in other respects, and therefore the one variety had to suffer and to lose a portion of its yield through over-ripeness and the falling of ears.

On the recommendation of Dr. Beaven one more measure was taken before harvest. This consisted in removing those outside rows of each strip which were neighboured by another variety. The object of this was to obviate any error that might arise from root interference between varieties affecting the yield of the outside rows.

The plots were harvested in the third week in August and threshed about six weeks later. Both the harvesting and the threshing were serious undertakings involving the marking of each sheaf, the erection of eight small stacks, and the very rigorous cleaning of the drum as each of these was finished off.

The results are expressed in the two following tables, which show among other things that there was a very marked variation in the two sides of the three acres of land employed, which with any less careful system of experiment would have sufficed to vitiate the results obtained. In studying the tables it is important to realise that each variety is comparable only with its own strips of the standard. For instance A with Archer can be compared with Archer with A, but not with any of the others. The marked variations which are shown between the different plots of the standard variety suggest that there was a considerable difference in the factors governing the growth of the plants in the different plots. No doubt this was so, though what the ruling differences were has not become obvious. As has already been said the effect is to show the great advantage of the system employed in securing that there shall be as little variation as possible in the environment and treatment of the plots that are to be considered as truly comparable.

VARIETY YIELD TESTS WITH BARLEY.

Table of Yields and Comparisons.

Variety	Corn Weights	Straw Weights	Comparison %	
			Corn	Straw
A with Archer	294 lb.	180 lb.	101.73	100
Archer with A	289 lb.	203 lb.	100	112.72
Archer with B	363 lb.	242 lb.	100	100
B with Archer	384 lb.	254 lb.	105.79	105.0
C with Archer	326 lb.	210 lb.	100	100
Archer with C	396.6 lb.	243 lb.	121.62	115.71
Archer with D	450 lb.	320 lb.	100	100
D with Archer	483 lb.	328 lb.	107.33	102.5

At the time of cutting Variety C, Golden Pheasant, was very much over-ripe while the standard Archer with which it is compared was in excellent condition for harvesting.

A large number of ears of the Variety C were lost on the ground, which accounts in part for the wide difference in the yields shown above.

VARIETY YIELD TESTS WITH BARLEY.

Table of Yields per Acre on Beaven Plots.

Variety	Per Acre	
	Corn Cwts.	Straw Cwts.
A with Archer	8.75	5.35
Archer with A	8.6	6.04
Archer with B	10.86	7.20
B with Archer	11.42	7.55
C with Archer	9.70	6.25
Archer with C	11.80	7.23
Archer with D	13.39	9.52
D with Archer	14.37	9.76

Remarks.—All the yields are extremely light both in corn and straw, and there can be little doubt that the spring drought was largely responsible for this. There is no known variation in the land on which the plots were situated to account for the wide difference in the yield of the different plots of the Standard Archer.

For the past two years the Institute of Brewing, with the co-operation of the Rothamsted Experimental Station, has been

carrying out a scheme of fertilizer trials with barley at a large number of centres scattered throughout the country. A somewhat similar set of plots was put down in Norfolk on the same farm as those which have just been described. The land employed can be classified as a light silty loam which had been cropped in the previous year with mangolds. A dressing of 10 loads to the acre of farm-yard manure has been supplied to the roots, which yielded some 16 loads to the acre.

There were five plots and the dressings of artificial manure applied to them were as follows:—

- (a) No Manure.
- (b) Complete Artificial—
 - 1 cwt. Sulphate of Ammonia
 - 3 cwt. Superphosphate
 - 1½ cwt. Sulphate of Potash.
- (c) Artificial without Nitrogen:—
 - 3 cwt. Superphosphate
 - 1½ cwt. Sulphate of Potash.
- (d) Artificial without Phosphate:—
 - 1 cwt. Sulphate of Ammonia
 - 1½ cwt. Sulphate of Potash.
- (e) Artificial without Potash:—
 - 1 cwt. Sulphate of Ammonia
 - 3 cwt. Superphosphate.

The seed employed was Beaven's Improved Archer of a pure strain and the seed rate was three bushels to the acre. Each plot measured half an acre (13 yards by 182 yards), and the five were placed side by side on a flat and regular piece of land.

Drilling took place on March 28, and some ten days later a mixture of rye grass and clovers was sown on the land and lightly harrowed in.

Germination was quick, strong and even, and growth was very satisfactory until it was checked by the drought of late spring and early summer.

Six weeks after drilling, on May 10, plots *b*, *d*, and *e* showed considerably more growth and vigour than the other two. The difference in the colour of the leaves was very marked, those on plots *a* and *c* showing yellow against the others. Shortly after this inspection a sharp shower of rain fell, and two or three days later the difference in the coloration of the leaves was but slight though the three first mentioned plots continued to appear more vigorous than the others. From the middle of May until towards the end of July very little rain fell and the growth of the barley was greatly checked on all the plots. When rain did come at last the plants had ceased "to run" and the straw was beginning to die. A great many ears failed to draw clear of the leaf-sheaths and as a consequence the lower grains

were either not developed at all or were thin and undersized.

The corn was cut and harvested on August 20 and 25, under fair weather conditions and the yields of corn and straw per acre worked out as follows:—

	Corn Per Acre	Straw Per Acre
Plot (a) No Manure	17.58 bushels	12.2 cwt.
(b) Complete Artificials	20.38 "	15.0 "
(c) Artificials without Nitrogen	18.60 "	12.51 "
(d) Artificials without Phosphates	18.61 "	13.50 "
(e) Artificials without Potash	20.38 "	14.59 "

Taking the lowest yield of corn and straw respectively as 100 these results work out as follows:—

	Corn	Straw
Plot (a)	100	100
(b)	115.92	122.95
(c)	105.23	102.25
(d)	105.85	110.65
(e)	115.92	119.59

It will be noticed at once that all the yields are low, and that considering the difference in the dressings of fertilisers, the differences in yield are very slight.

The greatest increase was obtained as might be expected on the plot receiving the complete fertiliser, though that receiving nitrogen and phosphate without the potash was very nearly as good. The cost of the various dressings was as follows:—

	£	s.	d.	
(b)	1	13	5½	per acre
(c)	0	16	5½	" "
(d)	1	2	8½	" "
(e)	1	7	9	" "

If the corn of the crop is valued at 6s. per bushel and the straw at 30s. per ton it will be found that the increases of yield due to the action of the fertilisers were not great enough to pay for them and that in each case a definite loss is registered.

(b) Cost of dressing not covered by increase of yield	12/5½
(c) " " " " " " " "	15/11½
(d) " " " " " " " "	14/8½
(e) " " " " " " " "	7/5½

Some part of this loss may be recovered in the crops of succeeding years, but even when such an allowance is made

there is still a small balance on his wrong side. The moral to be drawn from this is one which has been borne in upon many farmers of light corn land in the past year, to wit, that chemical fertilisers will not act without a sufficient rainfall and that plants will receive only a partial benefit from the dressings given to them unless there is a fair supply of moisture either from above or below during the growing season.

The samples of corn from all the plots were very similar and after dressing it was not possible to distinguish them by the eye.

During the dressing process it was noticed that the percentage of thin second quality grains was distinctly lower on plots (b), (d) and (e) than on the other two which had received no nitrogen.

It appears possible that though the rain came too late to allow the fertilisers to show their proper value, those plots which received sulphate of ammonia retained their sap and growing power a little longer than the others, and were able to push the ears clear of the leaf-sheath so that the lower grains developed properly.

The close similarity between the yields of the plot receiving the complete manure and that in which the potash was omitted, is remarkable, the more so as the land on which the plots were situated was of a type that might be expected to respond to potash dressings.

Similar results were obtained on some other sets of plots of much greater area in close proximity to those under discussion, and it seems fair to suppose that the spring drought affected the action of the potash even more drastically than that of the nitrogen and phosphates.

It is intended to continue both sets of experiments in the present year and in the case of the fertiliser trials a closer co-operation with Rothamsted has been sought and the plots will be more fully comparable with those found at other experimental centres throughout the kingdom.

PURE SEED PRODUCTION.

One of the great advances of Agriculture in the past fifty years, perhaps the greatest of all, is found in the improved varieties of plants which the breeders have been able to produce for the use of the farmers. The rediscovery of the principles of inheritance first set out by Gregor Mendel in 1865 has led to results which are plainly to be seen on the land and are beginning to appear in the stock yard also.

Cereals, in that they are normally self fertilised and very variable in character within the family, have afforded a ready field for experiment and study, the results of which are to be found in some of the new varieties of corn which are constantly

appearing on the market. Varieties of wheat such as Little Joss or Yeoman and of barley such as Beaven's Improved Archer are not the result of a lucky guess, but are carefully built up on scientific principles of inheritance from chosen ancestors. The process of patient breed building has been going on for a number of years and there are a great number of breeds and strains of each of our three most important cereals upon the market, some of which are much better than others.

It is too often a far cry from the laboratory and the experimental plot to the ordinary fields of commerce and despite much good scientific work and an increasing stock of improved seed upon the market very many acres are sown annually with what must be regarded as bad seed. The liaison between the scientist and the farmer is still weak, though it is rapidly improving, and in the same way the interchange of ideas and seed varieties between districts is not so easy and natural as it ought to be. Different districts take pride in the excellence of one or more crops and become famous as the headquarters of a particular product and it is desirable, where this pride is justified, that measures should be taken to spread knowledge of the approved practice and seed of the approved varieties of plant over as wide an area as possible.

The case of malting barley was one which particularly attracted the attention of the Research Committee of the R.A.S.E. and in conjunction with the scheme of experiments with barley, a part of which has already been considered, it was decided to push forward a plan for the production of a stock of pure seed of two varieties which were noted for the excellence of the malting samples they had produced and which were also good croppers, and likely to do well in a wide range of conditions. The varieties chosen were Plumage Archer and Beaven's Improved Archer, pure seed of which was obtained with some difficulty, and at considerable expense.

The crops were grown on the farm on which the experiments took place, and under the immediate control and direction of the Norfolk Agricultural Station. As in the case of the experimental plots the crops were light but the sample was excellent, and enough seed was produced to enable the scheme to be extended in the present year, not only in Norfolk but also in several other counties where barley is grown with success. It is hoped that after the next harvest the stock of pure seed will be considerable and that the advantages of it will be demonstrated by many members of the R.A.S.E. up and down the country who will be using it on their farms.

C. HEIGHAM.

Norfolk Agricultural Station,
R. F. 101, Norwich.

II.—THE MERITS OF HOME-PRODUCED FOODS FOR PIG- FEEDING.

INTRODUCTION.

THE tests dealt with in this Report were undertaken on behalf of the Research Committee of the Royal Agricultural Society, with the aid of funds placed at the disposal of this Committee by A. E. Marsh, Esq., for the purpose of experimental work in the feeding of pigs.

The primary object of the experiment was to test the relative merits for pig-feeding of various rations composed exclusively of home-produced foods. With this end in view it was decided at the outset that the feeding should be restricted entirely to home-produced grain foods, potatoes and dairy by-products. Practical considerations made it further necessary to restrict the test to "indoor" feeding. In order to avoid complications, the same system of feeding was adopted throughout, the meals being given in the usual "wet" form, the meals being weighed and the water measured for each lot of pigs daily.

The buildings of the college farm provide normally only very limited accommodation for pigs, but by adapting cattle boxes and other accommodation it was found possible to provide for 120 pigs, divided into 12 lots of 10 pigs each.

SCHEME OF EXPERIMENT.

With the 12 lots of pigs it was decided to test the following points:—

1. The relative merits of the different home-grown grain foods (wheat, barley, oats, beans and peas).
2. The effect of including potatoes in the ration up to 60 per cent. of the total food supply.
3. The necessity or otherwise for cooking potatoes.
4. The value of separated milk and whey in pig-feeding.

The scheme of feeding drawn up at the outset was as follows:

Lot	1.	1	barley meal,	1	sharps.	
"	2.	1	"	1	wheat meal.	
"	3.	1	"	1	"	1
"	4.	1	"	1	"	1
"	5.	1	"	1	"	1
"	6.	5 parts	"	4 parts	"	40 per cent. raw potatoes. ¹
"	7.	5	"	4	"	40 " cooked potatoes.
"	8.	10	"	7	"	60 " raw potatoes.
"	9.	10	"	7	"	60 " cooked potatoes.
"	10.	1	"	1	"	1
"	11.	1	"	1	"	1
"	12.	Equal parts barley, wheat, oat, pea and bean meals along with separated milk (as Pen 11) and potatoes (as Pen 8).				

¹ The proportions of the succulent foods are given in terms of their meal equivalents "on the following basis:—

1 lb. meal = 4 lb. potatoes = 6 lb. separated milk = 12 lb. whey.

It will be seen that the only food used that was not strictly home-produced was the sharps fed to Lot 1. No attempt was made at first to draw up "balanced" rations, the idea of the scheme being to use rations such as the farmer might be obliged to have recourse to if outlay on purchased feeding-stuffs were to be avoided. It was felt undesirable, however, to attempt the feeding without liberal recourse to barley meal, and this was consequently introduced into each ration.

The scheme outlined above was adhered to throughout the test so far as the nature of the foods used for each Lot was concerned, except that after about three months bean meal was introduced into the rations of Lots 1, 6, 7, 8, 9 and 10, as there seemed some likelihood that the rations of these Lots might be deficient in protein.

METHOD OF FEEDING.

The various meals were weighed out separately for each Lot daily and mixed into a slop with water starting at the rate of one gallon of water to each $2\frac{1}{2}$ lb. meal (later 1 : 4). The slop was given in two meals daily, namely, in the early morning and late afternoon, the amount being adjusted for each Lot to the quantity that would just satisfy the pigs at each meal. About midday a small quantity of green food was thrown into the sties, the nature of this varying according to supplies available. A little small coal, ashes or turf was also given, and after the first few weeks a special mineral mixture was also supplied at the rate of about $\frac{1}{4}$ oz. per head per day. For a short time during the early part of the test, acting on veterinary advice, a small quantity of cod-liver oil was also given with the food to each Lot with a view to allaying the skin irritation from which many of the pigs were suffering and which was preventing them from settling down satisfactorily.

The separated milk and whey were added to the food just before each meal, the whey being mostly fresh drawn, and never more than two days old. The potatoes for Lots 7 and 9 were boiled with water in an ordinary copper.

CLASS OF PIG USED.

With a view to securing a reasonably uniform lot of pigs for the experiment it was thought desirable to obtain the pigs, if possible, all from one farm, and with the assistance of Mr. Marsh arrangements were made with a local pig-feeding farmer to select the pigs required from his stock of over 400 commercial feeding pigs. Naturally it was impossible to select as many as 120 pigs of even size, but the best selection possible was made, and on July 7 120 selected pigs were delivered at the college farm. These pigs were not bred on the farm from which they came to

us, but had been purchased about three or four weeks earlier in various markets, and were of distinctly cross-bred character, showing chiefly indications of Large White, Middle White and Large Black ancestry.

As the test progressed we were soon driven to the conclusion that pigs of such mixed breeding form very unsatisfactory material for experimental purposes, since despite the care taken at the outset to make the Lots as closely comparable as possible, differences obviously due to breeding soon began to show between pigs originally fairly comparable, and consequently within each Lot the degree of variability between the individual pigs became unduly high.

The pigs were mainly about 10-16 weeks old on arrival, the individual weights ranging from 40 lb. to 95 lb. (See below.)

COURSE OF EXPERIMENT.

From the 126 pigs purchased the six worst were weeded out and the rest divided upon July 7 to form 12 Lots as nearly comparable as possible, the Lots being then weighed and showing a range of variation in weight per Lot of only 16 lb. or 1.6 lb. per head.

The Lots were given three days to settle down, during which period they were all fed alike, and then their rations were gradually changed over to the experimental rations, the change being completed by July 14. On July 17 the pigs were weighed individually, and this date may be regarded as the real commencement of the experimental period proper. The weights of the individual pigs and the averages for the Lots on this date are set out below:—

Weights of Pigs, July 17.¹

	Lot 1	Lot 2	Lot 3	Lot 4	Lot 5	Lot 6	Lot 7	Lot 8	Lot 9	Lot 10	Lot 11	Lot 12
lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
95	73	90	74	89	83	88	86	84	77	81	92	
73	70	79	71	71	77	83	75	79	76	81	84	
69	62	78	66	68	75	73	68	69	70	73	68	
68	61	69	65	64	68	63	60	69	65	71	65	
62	61	61	65	64	67	58	56	68	61	63	64	
60	60	59	60	59	58	58	55	68	58	61	50	
56	60	57	48	52	58	57	54	63	52	56	44	
56	54	46	48	48	53	54	50	59	49	56	42	
51	53	45	47	44	49	53	47	49	85	50	63	
48	49	45	64	40	47	42	77	46	54	46	52	
Av. per head	63.8	60.3	62.9	60.8	59.9	63.5	62.9	62.8	65.4	62.7	63.8	62.4

¹ A number of pigs were lost or culled out in the course of the experiment, and consequently the average weights per Lot here given do not agree in every case with those given in later tables, in which only pigs remaining at the end of the experiment are taken into account.

It will be noted that already within the short space of ten days the Lots were showing a decidedly greater variation (5.5 lb. per head) in average weight than when originally drawn, although the differences in feeding could hardly have begun to tell. This was undoubtedly mainly due to the breed differences above referred to, although some allowance must be made for the unavoidable fluctuations incidental to the weighing of animals.

The pigs were weighed again four weeks later, and subsequently at fortnightly intervals. At each weighing, except the second, each pig was weighed separately in addition to the total weight of each Lot being ascertained.

On August 24 two pigs were lost from Lot 7, and these were replaced on September 11. On the latter date a number of unsatisfactory pigs were culled out, two being taken from Lot 3, one from Lot 7, two from Lot 10 and one from Lot 12, but these were not replaced. A second pig was lost from Lot 12 later in the test. In the tables contained in this Report the records of such pigs lost or removed are not taken into account, and where replacements took place the records of the newly introduced pigs have been substituted.

From the very outset Lots 10, 11 and 12 forged steadily ahead of the rest, and indeed throughout the whole period of the experiment were the only Lots to make really satisfactory progress, due undoubtedly to the whey or separated milk included in their rations.

The slow rate of growth of most of the Lots caused a prolongation of the feeding into the autumn, when the early advent of very cold weather introduced further difficulties, some of the Lots suffering from cold in the improvised housing which had served well enough for the summer, but was ill-adapted for wintry conditions.

Every effort was made to improve conditions in this respect, but it was only too obvious that the progress of the pigs was being seriously hampered.

It was originally intended to draft the pigs away in batches as they attained the weight of 220-240 lb., but these plans were interfered with by the outbreak of foot-and-mouth disease in the county, which for many weeks prevented any removal of stock. It was not until December that an opportunity for disposal arose, and on December 3 a batch of 67 pigs was sent for slaughter to Messrs. Marsh & Baxter, Ltd., these pigs representing all that could be regarded as saleable for meat at the time. This date (December 3) must be regarded as the end of the experiment, representing a feeding period of 139 days.

The live weight increases, food consumption and feeding

costs are summarised in the following tables, more detailed information being given later in tables appended to the Report :—

Summary for Whole Period.

(a) LIVE WEIGHT.

Lot No.	No. of Pigs	Average Live Weight per Pig		Gain in 139 Days	Average Gain per Day	Average Gain per Day excluding First Month.
		July 17	December 3			
		lb.	lb.	lb.	lb.	lb.
1	10	63.8	184.1	120.3	0.87	0.98
2	8 ¹	61.1	150.8	89.7	0.64	0.72
3	7 ¹	68.3	172.0	103.7	0.75	0.86
4	9	60.4	176.3	115.9	0.83	0.93
5	10	59.9	203.0	143.1	1.03	1.16
6	10	63.6	147.0	83.5	0.60	0.70
7	9	69.1	169.3	100.2	0.72	0.85
8	9	61.2	151.2	90.0	0.65	0.74
9	10	65.4	171.3	105.9	0.76	0.89
10	8	63.5	265.9	202.4	1.46	1.60
11	10	63.8	276.4	212.6	1.53	1.70
12	8	63.6	263.3	199.7	1.44	1.53

(b) WEIGHT AND COST OF FOOD CONSUMED.

Lot No.	Food Consumed per Head		Food per 1 lb. Live-Weight Increase	
	Weight *	Cost	Weight	Cost
	lb.	s. d.	lb.	Pence
1	631	53 0	5.2	5.8
2	505	50 2	5.6	6.7
3	555	60 4	5.4	7.0
4	626	61 10	5.4	6.4
5	581	59 0	4.1	4.9
6	576	57 5	6.9	8.3
7	560	56 9	5.6	6.7
8	592	58 7	6.4	7.8
9	597	60 7	5.7	6.7
10	794	79 5	3.9	4.7
11	828	82 10	3.9	4.7
12	769	81 2	4.1	4.8

* The records of two pigs in Lot 2 and one pig in Lot 3 have been discarded in compiling these tables, although these pigs were actually present in the pens at the close of the experiment. Their records were, however, so far from those of any other pig in the Lots that their inclusion would have seriously distorted the averages. Their exclusion in no way affects the general conclusions with regard to these Lots.

* Potatoes, whey and separated milk taken in terms of "meat equivalent" (see p. 174).

(c) COMPARISON OF RETURNS WITH COST OF FEEDING.

Lot No.	Returns		Expenditure		Surplus (+) or Deficiency (-)
	Average Value per Pig at Close of 1st. per Score Dead Weight	Manurial Value of Food	Initial Value per Pig at 172. 64. per Score Live Weight	Cost of Food	
	s. d.	s. d.	s. d.	s. d.	s. d.
1	94 6	5 8	55 10	58 0	-13 8
2	73 10	3 8	53 5	50 2	-24 1
3	81 7	4 0	59 9	60 4	-24 6
4	91 10	5 1	52 10	61 10	-17 9
5	109 6	4 6	52 6	59 0	+ 2 6
6	81 1	4 2	55 7	57 5	-27 9
7	90 0	4 0	60 5	56 9	-23 2
8	86 0	4 4	53 7	58 7	-21 10
9	91 0	4 4	57 2	60 7	-22 5
10	145 5	5 7	53 7	79 5	+15 2
11	154 8	5 11	55 10	82 10	+21 11
12	142 1	7 2	55 7	81 2	+12 6

NOTES ON INDIVIDUAL LOTS.

General.—Reference has already been made to the initial difficulties in inducing the pigs to settle down, these being particularly noticeable in the case of Lots 6 and 8 (raw potatoes).

Differences in appetite between the Lots also soon became evident, Lots 2, 3, 5, 6 and 8 showing a tendency to lag behind the other Lots, although some of these, notably Lot 5, showed a distinct improvement later. On the other hand, Lots 4, 10, 11 and 12 ate well from the outset, the difference in this respect between Lot 4 (bean meal) and Lot 5 (pea meal) being very striking in the earlier stages.

The progress of the experiment after the first month showed no abnormal features until the sudden onset of cold weather in early October, which showed its effects in a marked diminution in the rate of growth, except in the case of Lots 5, 7, 9, 10, 11, 12, all of which were housed under rather less-exposed conditions than the rest. Steps were taken to improve the conditions for the other Lots, but their housing conditions could not be regarded as quite as satisfactory as those of the Lots above named, though no worse than those under which large numbers of pigs are housed throughout the country.

No special comment is necessary at this stage on the general progress of the Lots, except for the following:—

Lot 3 (Oats).—With this Lot considerable difficulty was experienced in securing a satisfactory consumption of the oats.

When fed in bruised form there was always a very considerable residuum, composed mainly of husk, which the pigs would not eat. It was only when the oats were given in very finely ground form that a really satisfactory consumption was secured.

Lot 5 (Pea Meal).—This Lot suffered a set-back in late October through a consignment of pea meal which proved to be in bad condition, which was not detected for some days. As already indicated, this Lot did not eat very well during the first month of the test, but subsequently, apart from the check just mentioned, little fault could be found with their appetite.

Lots 6 and 8 (Raw Potatoes).—Great difficulties were experienced in getting the pigs to consume the scheduled rations of raw potatoes. Various methods of giving the potatoes were tried, but all proved unsatisfactory, and it was not until towards the end of the experiment, when the pigs were well over 100 lb. live-weight, that a satisfactory consumption was secured. At this stage the potatoes were fed in pulped form as a separate meal in the middle of the day.

Lot 12.—This Lot made an excellent start, showing a distinct lead over all the other Lots, but after about ten to twelve weeks suffered a distinct loss of appetite, for which no obvious reason could be traced and which persisted for two or three weeks. A possible explanation lay in the reduction of the allowance of separated milk which became necessary at this time, but this was not reflected in the case of Lot 11, which suffered a similar reduction and yet fully maintained its appetite.

DISCUSSION OF RESULTS.

General.—Attention has already been directed to the marked superiority of Lots 10, 11 and 12, which received either separated milk or whey, over all other Lots.

The best of the remaining Lots was Lot 5 (pea meal), followed by Lot 4 (bean meal) and Lot 1 (sharps). All the potato-fed Lots (Lots 6, 7, 8, 9) were very unsatisfactory, as were also Lot 2 (wheat meal) and Lot 3 (oats).

It is perhaps not surprising that the best rate of growth was shown by the Lots receiving milk or whey, but it is difficult to understand why some, at any rate, of the other Lots did not achieve better records. Attention may be directed, however, to the last column of Table (a), p. 178, which shows how considerably the averages were depressed by the very poor results of the first month.

Were it not for the good progress made by Lots 10, 11 and 12, we should have been inclined to put the blame largely on the quality of the food, and doubtless this played a part, especially in the earlier stages. We can hardly resist the conclusion, however, that the greater part of the explanation must have

lain in the character of the rations. In many cases, especially the potato-fed Lots and Lots 2 and 3, there was almost certainly a deficiency of protein—this view being supported by the order of merit indicated above, when compared with the appended data as to protein consumption.

Daily Protein Consumption Per Head.

(Digestible Crude Protein.)

Lot	Average	Range during the course of the test		Average per 100 lb. Live Weight
		lb.	lb.	
1	0.42	0.25	to 0.70	0.34
2	0.32	0.21	" 0.45	0.30
3	0.35	0.19	" 0.59	0.29
4	0.45	0.27	" 0.58	0.33
5	0.42	0.27	" 0.62	0.32
6	0.35	0.19	" 0.47	0.33
7	0.33	0.20	" 0.50	0.28
8	0.35	0.19	" 0.48	0.33
9	0.35	0.21	" 0.53	0.30
10	0.45	0.22	" 0.69	0.28
11	0.54	0.31	" 0.71	0.32
12	0.76	0.38	" 0.88	0.46

It will be noted that all the Lots which have been mentioned as doing specially badly (Lots 2, 3, 6, 7, 8, 9) received on the average less than 0.4 lb. digestible protein per day, whilst the best Lots received over 0.4 lb. Lots 11 and 12 indeed received over 0.5 lb., but in view of the excellent record established by Lot 10 (whey) receiving only 0.45 lb. it seems doubtful whether the extra protein consumed in these cases produced any special effect.

In the commonly used tables of protein requirement this usually ranges from about 0.4 lb. for pigs weighing 60 lb., up to about 0.6 lb. for pigs of 160 lb., or 0.75 lb. for pigs of 250 lb., this representing an average of about 0.5 lb. for the feeding period. From our results it would appear that these "standards" err, if anything, a little on the high side, especially in the earlier stages of feeding.

As previously pointed out, we made at the outset no attempt to devise "balanced" rations, as our primary object was to test as many mixtures of home-grown foods as possible. Later we introduced bean meal into some of the rations that were lowest in protein, but we were unable to detect any appreciable improvement in the subsequent progress of these Lots. It would appear, therefore, that so far as the amount of protein supplied was

concerned, it did not furnish a complete explanation of the poor progress of the Lots in question, and some other factor or factors must have been involved. The supply of mineral matter suggests itself as a factor that may have been operative, but this is hardly likely in view of the steps taken to guard against it by the addition of a mineral mixture to the rations of each Lot from a very early stage of the experiment. Vitamin deficiency also might be suspected, but here again the risk would appear to have been small, seeing that green food was regularly supplied throughout the Lots.

We are not prepared to venture any specific explanation of the disappointing records of so many of the Lots, and can only conclude from our results that cereal meals alone or fed along with potatoes cannot be depended upon to give satisfactory results, and even though the addition of bean meal or pea meal to these may effect a considerable improvement, the results still fall much short of those attainable where supplies of whey or separated milk are available. In certain cases a closer study of the individual records brings out points of interest which need to be kept in mind in comparing the records of the different Lots, and it is desirable, therefore, that we should comment on each Lot separately.

In particular it is necessary to bear in mind that there would have been differences between the Lots even if all had been fed exactly alike. We cannot assume, therefore, that any difference between two Lots is necessarily due to the difference in feeding, without first making some allowance for what we may term the normal variation between the Lots. A careful examination of all the figures suggests that a difference of not more than about 10 lb. between the average gains (per pig) in live weight for the period of the experiment must be regarded as just as likely to be purely accidental as otherwise, and we doubt whether differences much less than, say, 30 lb., can be regarded as really significant of a definite difference due to the difference in the rations. This would correspond to a difference of about 0.2 lb. in the rate of gain per day.

In considering the following commentary on the individual Lots, attention should be paid to the table in the Appendix (Table I), giving the individual increases of live weight in each Lot.

Lot 1 (Barley and Sharps).—In this Lot no replacements were necessary and the ten pigs originally assigned to it passed through the whole experiment. Two of the pigs (Nos. 1 and 5) steadily grew away from the rest and showed for the whole period the satisfactory average daily increases of 1.34 lb. and 1.29 lb. respectively. At the other extreme, however, were the three pigs, Nos. 6, 8 and 10, which gave average increases of only 0.49, 0.51 and 0.57 lb.

respectively. This Lot indeed proved to be one of the most variable. The pigs as a whole never developed a satisfactory "bloom" and seemed to tend more towards growth of bone and flesh rather than to fatten. This was confirmed by the relatively poor carcass weights shown by the seven pigs from this Lot sent for slaughter at the end of the experiment, the average proportion of carcass being only 69 per cent. of their live weight taken on leaving the farm.

The high variability indicated above accounts for the rather disappointing average gain in live weight of this Lot (0.87 lb. per head per day), coupled with the high food consumption of 5.2 lb. meal per 1 lb. live-weight increase. Previous experience in feeding pigs on barley meal and sharps led us to expect an average gain of at least 1 lb. per day from a consumption of about 4 lb. food, but this was certainly with a better class of pig.

Lot 2 (Barley and Wheat).—This was the most unsatisfactory Lot of all. The pigs never did well at any stage of the test. They did not eat well and always showed the characteristic rough coat of the unthrifty pig.

All the pigs originally drawn in this Lot survived the test, but in two cases, Nos. 3 and 6, the rate of progress was so very much inferior to that of the rest of the pigs in the Lot that we have excluded the records of these two pigs from our averages. Even without these the average gain in live weight was only 0.64 lb. per day, the gains for the individual pigs ranging from 0.35 lb. to 0.99 lb.

The consumption of food was at the average rate of 5.6 lb. per 1 lb. live-weight increase—a figure not greatly in excess of that shown by Lot 1. Combined with the fact that Lot 2 shows the lowest total food consumption, this brings out clearly that the fundamental difficulty with this Lot was to secure an adequate food consumption. Such food as was consumed was apparently used to pretty much the same advantage as in many of the other Lots.

Only two pigs were fit for sale from this Lot at the end of the test, and they gave only the low carcass percentages of 66 and 64 per cent. respectively.

Lot 3 (Barley, Wheat and Oats).—Two pigs (Nos. 2 and 10) were culled from this Lot at an early stage, but the rest, with one exception (No. 6), gave one of the most uniform Lots, the individual average daily increases (excluding No. 6) ranging from 0.54 to 0.96 lb., with an average for the Lot (seven pigs) of 0.75 lb.

This disappointing average is undoubtedly due to comparatively low consumption of food. Reference has already been made to the difficulty in securing satisfactory consumption of the oats, and this undoubtedly reacted unfavourably on the

general appetite of the pigs. The average of 5.35 lb. of food consumed per 1 lb. live-weight increase compares favourably with Lot 1, although it cannot be regarded as satisfactory.

In appearance the pigs always looked to be making better progress than their weighings revealed, and their general appearance was superior to that of many of the other Lots that showed greater increases in weight. This was confirmed by the four pigs slaughtered at the end of the test, which gave an average carcass percentage of 71.0.

Lot 4 (Barley, Wheat and Beans).—This Lot began very well, but after the second month there was a falling off and loss of bloom. The Lot tended to become very uneven, the pigs also developing bone and flesh rather than fattening. This was borne out by the average (six pigs) carcass percentage of 69.4 shown at the close.

The average gain in live weight per day was 0.83 lb., the range of the individual increases being from 0.5 lb. to 1.01 lb. The average food consumption per 1 lb. live-weight increase was 5.4 lb. These results must be considered very disappointing for this particular ration, and it is difficult to find a satisfactory explanation.

Lot 5 (Barley, Wheat and Peas).—This was quite the most satisfactory of the grain Lots. They started rather indifferently, but subsequently, apart from the check previously alluded to, they ate extremely well, and indeed towards the close excelled all other Lots in that respect. They did not grow as "leggy" as most other Lots and always looked thrifty and carried a good bloom. Eight of these pigs were marketed at the close of the test and showed an average carcass percentage of 72.

The average live-weight increase per day was 1.03 lb., the individual increases ranging from 0.81 lb. to 1.32 lb. The average food consumption per 1 lb. live-weight increase was 4.1 lb.—a figure excelled only by Lots 10 and 11.

Lot 6 (Barley, Wheat and 40 per cent. Raw Potatoes).

Lot 8 (Barley, Wheat and 60 per cent. Raw Potatoes).

These two Lots may be considered together and we have not a good word to say for either, except that no pigs were lost from either Lot from any cause attributable to the feeding. They never settled down properly—Lot 8 being even worse than Lot 6 in this respect—and always had more the appearance of second-class stores than of fattening pigs. They were thriftless feeders, skinned, and never developed any sort of condition. Only a few pigs in each Lot grew well away from the rest, this being especially the case in Lot 8. Reference has already been made to the difficulty experienced in feeding the raw potatoes. The average gains in live weight per day and the food consumption per 1 lb. live-weight increase were as follows:—

	Live-Weight Increase per		Average Food Consumed per 1 lb. Live-Weight Increase
	Average	Day Range	
	lb.	lb.	lb.
Lot 6	0.60	0.44 to 0.89	6.9
Lot 8	0.66	0.42 „ 1.22	6.4

Rather to our surprise, the carcass percentages for the four pigs marketed from these Lots came out better than those from some of the other Lots, the two pigs from Lot 6 averaging 73.6 and the two from Lot 8 averaging 75.8 per cent. These percentages were certainly not reflected in the appearance of these pigs on leaving the farm.

Lot 7 (Barley, Wheat and 40 per cent. Cooked Potatoes).—This Lot ate fairly well all through and grew into healthy, strong pigs, but rather of store character than fat. Their record at the weighbridge was distinctly disappointing, the average gain in live weight per head being only 0.72 lb., the individual increases ranging from 0.34 lb. to 0.99 lb.—or, excluding the lowest, from 0.60 to 0.99 lb. The average food consumption (expressed as meal) per 1 lb. live-weight increase was 5.6 lb.—a figure which suggests that the ration was not well suited to the physiological needs of the pigs.

The average carcass percentage of the three pigs marketed from this Lot was 71.7.

Lot 9 (Barley, Wheat and 60 per cent. Cooked Potatoes).—This Lot showed up better at the weighbridge than its performance and appearance in the pen would have suggested. This, however, was undoubtedly due to some extent to one particular pig (No. 2), which showed the average gain in live weight of 1.34 lb. per day, although in fact it was not a satisfactory pig and killed badly.

The pigs generally fed well, without showing a great deal of bloom, and were never very pleasing to the eye.

The average gain in live weight per day was 0.76 lb., the individual increases ranging from 0.42 lb. to 1.34 lb. (or, excluding the latter, from 0.42 to 0.94 lb.).

The average food consumption (expressed as meal) per 1 lb. live-weight increase was 5.66 lb. The same comment may be made on this figure as was made above for Lot 7.

The average carcass percentage of the six pigs sold from this Lot was 70.8.

Lot 10 (Barley, Wheat and Whey).—This was a good lot all the way through. Apart from a slight falling off of appetite towards the end, they ate well all through, rested more and did not develop “legginess” to the same degree as Lot 11. The contrast in progress between this Lot and all others, except Lots 11 and 12, was very striking, as is shown by the records. The average gain in live weight per day was 1.46 lb.; the

individual increases ranging from 1.23 lb. to 1.6 lb.—a very uniform record.

The average food consumption (expressed as meal) per 1 lb. live-weight increase was 3.91 lb.

All the pigs (eight) of this Lot were sold at the end of the test and their average carcass percentage was 72.8.

*Lot 11 (Barley, Wheat and Separated Milk).—*This was a very good lot all the way through. The pigs ate consistently well, but grew rather "leggier" than Lots 10 and 12, although on the other hand they developed distinctly more fat along the back. This latter fact doubtless accounts for the higher carcass percentage shown by this Lot (*see below*).

The average gain in live weight per day was 1.53 lb., the range for the individual pigs being from 1.30 lb. to 1.84 lb.—an extraordinarily good record.

The food consumption (expressed as meal) per 1 lb. live-weight increase was 3.9 lb., a figure agreeing closely with that of Lot 10.

All the pigs (ten) of this Lot were sold, the average carcass percentage being 74.6.

This was undoubtedly the best and most profitable Lot of all. *Lot 12 (Mixed Cereal, Bean and Pea Meals, Separated Milk and Potatoes).—*As previously stated, this Lot took a distinct lead at the outset, but subsequently fell off somewhat in comparison with Lots 10 and 11. Nevertheless, they grew into very good pigs and put up an excellent record. In general type they approximated more to Lot 10 than to Lot 11.

The average gain in live weight per day was 1.44 lb., the range for the individual pigs being from 1.08 lb. to 1.9 lb.

The food consumption (expressed as meal) per 1 lb. live-weight increase was 4.06 lb.

All the pigs (eight) of this Lot were sold, the average carcass percentage being 71.9.

COMPARISON OF LOTS.

An experiment like the present with twelve different rations furnishes no fewer than sixty-six different comparisons, but many of these need not be considered separately, since the differences involved are well within the normal variation as defined on page 182.

Taking the live-weight increases as the basis of comparison and making the allowance suggested for normal variation, we can state the following conclusions:—

Lots 10, 11 and 12 are definitely better than any other Lot, but do not differ from each other outside the normal limits of variation. They must consequently be regarded as substantially equal from the point of view of live-weight increase.

The other Lots (1-9) may thus be treated as a separate group and show the following results:—

The best of these is undoubtedly Lot 5, this being definitely superior to all other Lots, except possibly Lots 1 and 4, in relation to which the differences fall just short of the limit we have suggested as definitely significant.

Next in order come Lots 1 and 4, with substantially equal records. Lot 1 shows slightly the better record of the two, being definitely superior to Lots 2, 6 and 8, whilst Lot 4 is definitely superior only to Lot 6, although probably superior also to Lots 2 and 8.

The remaining Lots (2, 3, 6, 7, 8, 9) cannot be placed definitely in any order of merit, the differences in every case falling well within the normal variation.

Comparison of Sharps and Whole Wheat Meal (Lots 1 and 2).—Lots 1 and 2 furnish this comparison, and as stated above there is a difference in favour of sharps sufficiently great to be regarded as significant. We can only conclude, therefore, that whole wheat meal fed in the proportions given in our rations (up to 50 per cent.) is not satisfactory. The question must, however, remain open whether it could not be used in smaller proportions with greater success.

Use of Oats (Lot 3).—Our experience on this point is unfavourable to the use of oats, of which our rations contained at most 25 per cent. Where oats are used they should be fed in finely ground condition, and even then it is doubtful whether oats can be regarded as a satisfactory pig food.

Comparison of Beans and Peas (Lots 4 and 5).—This comparison is afforded by Lots 4 and 5, and as already indicated the better result was given by the ration containing pea meal, although the difference in the average live-weight increases (27.2 lb.) was just on the margin of what we have suggested (30 lb.) might be regarded as significant. We should hesitate, however, to place too much stress upon this result, and the question is one that might well form the subject of a further test.

It is of interest, however, to note that the addition of bean meal or pea meal to mixed cereals produced a very definite improvement in the results obtained, as shown by the comparison of Lots 4 and 5 with Lots 1, 2, 3, 6, 7, 8, 9.

Raw and Cooked Potatoes (Lots 6, 7, 8 and 9).—On this point, despite the comparatively large number of pigs used, the experiment is indecisive. Certainly in each of the two pairs of comparisons (6 and 8, 7 and 9) the difference is in favour of the cooked potatoes, but it is not large enough to be accepted as significant.

Nevertheless, the general run of the test with these Lots

leaves us very definitely of the opinion that there is distinct practical advantage in the cooking of potatoes for pigs which outweighs the extra cost involved for fuel and labour. In our case, the cost of fuel used worked out at 10d. per pig for Lot 7 and 1s. 6d. per pig for Lot 9.

The experiment is indecisive also with regard to the different quantities of potatoes fed, whether we compare Lots 6 and 8 or Lots 7 and 9. In each case there is a difference in favour of the Lot receiving the heavier proportion of potatoes, but it is too small to be accepted as significant.

Feeding of Dairy Produce (Lots 10, 11 and 12).—The one outstanding lesson of the experiment is the very great advantage which accrues where separated milk or whey are available to supplement cereal rations. The difference shown in the experiment is so great as to place these Lots (Lots 10, 11 and 12) in a separate class altogether from the rest.

It is of interest to note that the results obtained with whey and with separated milk were practically the same, which bears out the accuracy of the estimate of their relative values upon which the quantities fed were based, viz., 2 lb. whey = 1 lb. separated milk.

It is of further interest to note that the more complicated ration (including beans, peas and potatoes) fed along with separated milk to Lot 12 did not produce any better results than those obtained with the simpler meal mixture fed to Lot 11.

FINANCIAL RESULTS.

Throughout the experiment a careful record was kept of all expenditure incurred, but we do not think it necessary to deal here with more than the comparison of the cost of purchase and feeding the pigs with the values realised. From the point of view of financial returns the experiment was most unfortunately timed in that it met the rapidly falling market which proved such a bugbear to the pig-feeder during the autumn of 1923. This is illustrated by the fact that the pigs were taken in on the basis of 17s. 6d. per score live weight and realised only at the rate of 15s. per score dead weight, the latter representing absolutely the highest point of the market at the time of disposal.

The pigs could doubtless have been purchased at least 2s. 6d. per score (or 7s. 6d. per head) more cheaply had they been picked up in the usual way in small lots in the market, but we thought it better material from the point of view of experimental work could be obtained by drawing all the pigs from one place, and the achievement of this object entailed some concession in price.

For these reasons the financial results must be regarded as

distinctly abnormal and are given with all reserve. The figures are summarised in Table (c), page 179.

In this table the figures given in the first column for the average value per pig at the close of the experiment have been calculated for each Lot from the average live weight of the Lot at the last weighing, by assuming for the Lot a carcass percentage equal to the average shown by the pigs from that Lot that were actually slaughtered, *e.g.*, the ten pigs of Lot 1 averaged 184 lb. live weight at the end of the test. Seven of these went for slaughter and gave an average carcass percentage of 68.7. Hence the average carcass weight for this lot is taken as 68.7 per cent. of 184 lb. or 126 lb. This at 15s. per score gives an average value per pig of 94s. 6d.

The manurial values of the rations were calculated from figures given in Leaflet No. 73 issued by the University of Leeds.

The prices charged for the individual foods are given in the Appendix, Table IV.

It will be seen that the only Lots to show a margin over and above the cost of feeding are Lots 5, 10, 11 and 12—the margin in the case of Lot 5 being only very small and barely equal to the allowance made for the manurial value of the food.

On the other hand, the margins shown by Lots 10, 11 and 12 are in each case substantial, despite the adverse conditions of sale, and there can be no doubt that under average market conditions a very satisfactory profit would have been recorded by these Lots.

The greater part of the deficits shown must undoubtedly be ascribed to the abnormal market conditions above referred to, but at the same time it is clear that even under what might have been accepted as normal conditions there could not have been a profit on some of the Lots. We must restrict ourselves, however, to the actual conditions that prevailed in this case, and we have given sufficient data to enable anyone to calculate what the results might have been under any other condition of prices.

A word of explanation of the comparatively high cost of feeding of Lot 3 is perhaps necessary. This was attributable to the dearness of oats during the autumn of 1923, crushed oats costing on the average 15s. 9d. per cwt., as compared with barley at 10s. 11d. and wheat at 12s. per cwt.

The cost of labour averaged 5s. per pig for the period of the experiment (twenty weeks).

SUMMARY AND GENERAL CONCLUSIONS.

The experiment described in this Report was designed on strictly practical lines, its primary object being to test the actual value in pig-feeding of various combinations of home-produced foods, starting with a basal ration of barley and wheat

meals (Lot 2) and introducing into this by way of substitution one or other of the alternative grain foods or dairy by-products. In drafting these rations we were guided not so much by what we expected to be satisfactory as by what we considered many farmers might wish to use, or indeed in the event of low grain prices, might almost be compelled to use. We did not think it advisable to attempt rations composed exclusively of wheat or oats or both, since general experience in pig-feeding indicates that of the home-grown grains barley is the only one that can be fed safely and satisfactorily in large quantities to pigs.

From previous experience we had little hope that certain of our rations would prove profitable, but we desired to obtain for the farmer definite figures on the point. The results in these cases have more than confirmed our misgivings, and the results of the test make it clear that satisfactory rations cannot be made up from cereals (*i.e.*, wheat, barley and oats) alone.

In the case of *oats* it seems clear that these can only be used in pig-feeding to a very limited extent, and we doubt whether their inclusion in pig rations is in any case worth while.

In the case of *wheat* it would seem to be doubtful policy to include as much as 50 per cent. in rations, and in this test, at any rate, where this amount was used the results were decidedly inferior to those obtained with a similar proportion of sharps.

The effectiveness of the cereal rations is, however, greatly increased by the addition of *bean meal* or *pea meal*. In this test the latter in particular has produced a marked improvement over the plain cereal rations. We do not claim, however, that our results establish a general superiority of pea meal over bean meal, and regard this point as needing further investigation before such a pronouncement can be made.

The addition of *potatoes* to a ration of barley and wheat meals did not effect any appreciable improvement in results, nor perhaps was this to be expected. Potatoes are poor in protein and rich in carbohydrates, so that the proper type of food to give along with them would appear to be one comparatively rich in protein rather than starchy foods such as barley and wheat. It is noteworthy, however, that when about two-thirds of the way through the experiment bean meal was introduced into the rations of the "potato Lots" (Lots 6, 7, 8 and 9), no appreciable improvement could be detected, so that the explanation of the poor progress of these Lots cannot lie more than partly in the question of protein supply.

It is possible that by variation of the meal rations fed along with the potatoes or of the proportions between the two, better results might be obtained than were given in this test, but that can only be determined by further tests, and we are concerned here only with the results actually obtained in our experiment.

The comparison of *raw potatoes* against *cooked potatoes* proved indecisive so far as the actual numerical results of the test were concerned, but a very definite impression in favour of cooking was obtained, a satisfactory consumption being more easily obtained with the cooked potatoes, and the general appearance and bloom of the pigs was distinctly superior to that of the pigs receiving raw potatoes, whilst the cost of fuel and labour involved in the cooking forms but a very small addition to the feeding cost.

It is held by many feeders that there is an element of danger involved in feeding raw potatoes, but this view does not receive any support from our test, since out of the twenty pigs receiving raw potatoes none were lost, except from causes which were quite definitely traceable to factors other than the food.

The most striking feature of the experiment has been the very great improvement effected when part of the cereal ration was replaced by either separated milk or whey—especially the former. This produced an improvement far beyond that obtained with pea meal, as is shown by comparison of Lots 10 and 11 with Lot 5.

Although it is not possible to give a precise figure for the value realised through the pig for the separated milk, this was certainly very much greater than 2*d.* per gallon, at which it was charged in the food costings. Indeed, from a comparison of Lot 11 with Lot 2 it would appear that the separated milk made through the pig a value of almost 9*d.* per gallon, and even when compared with Lot 5 (pea meal) the value realised works out at nearly 7*d.* per gallon. These are extraordinary figures and it must be emphasised that they apply only to the experimental results and should not, without further confirmation, be made the basis of generalisations. Moreover, it must be remembered that had the conditions of experiment not ruled out purchased foods, meal rations could have been devised which would almost certainly have given results not far short of those obtained with Lot 11. From the best evidence at our disposal we should estimate the value of separated milk in pig-feeding as compared with the best rations not containing it (or whey) at about 4*d.* per gallon, assuming market conditions for purchase and sale of pigs and feeding-stuff prices to be similar to those ruling of late.

The results obtained with whey (Lot 10) were nearly equal to those obtained with separated milk, and consequently since double the quantity was used, the value of whey would appear to be roughly one-half of that of separated milk.

The results obtained with Lot 12 broadly confirm those obtained with Lot 10, but no special advantage seems to have been derived from using the complex grain mixture and potatoes. Apparently, when separated milk is available a plain cereal supplement furnishes all that is necessary.

In conclusion, we would express our appreciation of the generosity of Mr. Marsh which has made our experiment possible, and also of the direct personal interest and assistance which he has rendered us throughout. We owe our thanks also to the Research Committee of the Royal Agricultural Society for their interest in the experiment, and for the ready way in which they have met our requirements at every stage of the test.

We are indebted to Messrs. Marsh & Baxter, Ltd., for the great trouble taken to secure for us the information as to the dead weights of individual pigs and also for reports on their quality and for facilities for the inspection of the carcasses. Our thanks are also due to our colleagues, Mr. W. T. Price and Mr. C. H. Cooke, for frequent and valued assistance in connection with the general supervision of the experiment.

CHARLES CROWTHER,
W. S. CHALMERS.

Harper-Adams Agricultural
College, Newport, Salop.

POSTSCRIPT.

Of the 111 pigs in hand at the close of the experiment on December 3, 67 were disposed of for slaughter and the remaining 44 being unfit for slaughter, were retained for further feeding. It is of interest to note the distribution of these amongst the various Lots.

Lot	No. of Pigs Available	No. of Pigs left after December 3
1	10	3
2	10	8
3	8	4
4	9	2
5	10	2
6	10	8
7	9	6
8	9	7
9	10	4
10	8	0
11	10	0
12	8	0

It will be noted that more than half of the pigs remained in hand from Lots 2, 6, 7 and 8, whilst on the other hand every pig had been disposed of from Lots 10, 11 and 12.

On December 3, 1923, the 44 remaining pigs were regrouped and all placed on the same ration, which consisted of 50 per cent. barley, 20 per cent. sharps, 10 per cent. bean meal, 10 per cent.

pea meal and 10 per cent. fish meal. Subsequently the proportion of barley was gradually increased, and the other ingredients reduced to a final ration of roughly 60 per cent. barley, 12½ per cent. sharps, 10 per cent. beans, 10 per cent. peas and 7½ per cent. fish meal. A little whey was also occasionally available.

Twenty-five of these pigs were sold on February 8, 14 on March 20, and the remaining 5 on March 26.

The contrast of the progress of these pigs on the new ration, in devising which we were not hampered by any experimental limitations, with their progress prior to the change, was very extraordinary, as the following summary indicates:—

	Average Daily Live-Weight Increase for last 10 weeks of Experiment. (Sept. 25-Dec. 3, 1923)	Average Daily Live-Weight Increase for subsequent 86 days. (Dec. 3, 1923-Feb. 8, 1924)	Average Daily Live-Weight Increase for 41 days after February 8. (Feb. 8-March 20)
Average of 44 Pigs	lb. 0.62	lb. 1.62	lb. —
“ of best 25 Pigs sold February 8	0.71	1.85	—
“ of remaining 19 pigs	0.51	1.32	1.37
Average Carcass Percentage of 25 pigs sold February 8 = 72.2 per cent.			
“ “ “ 14 “ March 20	= 78.0 “		

In considering these figures it must be borne in mind that the 44 pigs represented the very worst of the experimental pigs, all pigs that could on the very lowest standard be regarded as fit for slaughter having been included in the batch of 67 pigs disposed of on December 3, 1923. For purposes of comparison we have given above the averages for the pigs for the last ten weeks of the experiment, i.e., for the period from September 25 to December 3, 1923.

A glance at the figures is sufficient to indicate the extraordinary improvement effected, the average for the sixty-six days subsequent to December 3 being 1.62 lb. per head per day, or 2½ times greater than that for the ten weeks prior to this date. At no time did the amount of food supplied exceed 6½ lb. per head per day, and the average consumption was at the rate of 3½ lb. per 1 lb. live-weight increase.

We have also set out separately the averages for the 25 pigs sold on February 8, 1924, and the remaining 19 which were not then fit for sale. It will be noted that the relative improvement was the same in each section, although naturally the better

section showed the higher average gain, reaching the very satisfactory figure of 1.86 lb. per head per day.

The remaining 19 pigs were fed for a further period of forty-one days (February 8 to March 20), and for this period showed an average gain of 1.37 lb. per head per day, a rate which agrees almost exactly with their record for the previous period (December 3, 1923 to February 8, 1924). This uniformity of progress was very noticeable throughout the whole period subsequent to the experiment, and in very great contrast to the performances of the individual pigs when on the various experimental rations.

It is clear from these figures that the poor progress made by these pigs during the experimental period could not be attributed to any inherent unthriftiness of the pigs, and they make it increasingly evident that the poor results of the experimental period must have been primarily due to the feeding difference. They emphasise further how greatly the feeding value of home-grown foods can be enhanced by a judicious blending with appropriate purchased food.

Further details relating to this supplementary period of feeding will be found in the Appendix, Table VI.

APPENDIX.

TABLE I.

Average Increase in Live Weight per Day for the Individual Pig of each Lot for the Whole Experimental Period.

(July 17 to December 3, 1923—139 days.)

Lot No.	Pig No.										Average for Lot
	1	2	3	4	5	6	7	8	9	10	
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
1	1.34	0.86	0.91	0.97	1.29	0.49	0.95	0.51	0.76	0.57	0.87
2	0.90	0.56	0.22	0.53	0.58	0.13	0.85	0.35	0.55	0.99	0.64
3	0.76	—	0.89	0.64	0.70	0.13	0.54	0.96	0.74	—	0.73
4	1.01	0.90	—	0.71	0.90	1.00	0.50	0.84	0.69	0.95	0.83
5	0.88	1.26	0.88	0.96	1.32	0.81	0.81	1.26	0.82	1.31	1.03
6	0.75	0.44	0.88	0.58	0.47	0.52	0.65	0.58	0.55	0.59	0.60
7	0.78	0.60	0.90	0.61	0.78	0.82	—	0.34	0.86	0.73	0.73
8	1.22	0.40	—	0.52	0.45	0.42	0.53	1.04	0.42	0.75	0.65
9	0.42	1.34	0.91	0.53	0.47	0.88	0.94	0.86	0.68	0.55	0.74
10	1.56	1.38	1.52	1.60	1.44	—	1.36	1.51	—	1.29	1.46
11	1.37	1.49	1.66	1.35	1.71	1.30	1.53	1.55	1.48	1.84	1.53
12	1.40	1.08	1.50	1.34	1.45	1.90	—	—	1.45	1.40	1.44

These pigs were not included in averages here shown.

TABLE II.

Average Increases (per Head per Day) for each Lot for each Period of the Experiment.

Lot No.	Period							
	1st July 17- Aug. 14, 28 days	2nd Aug. 14- Sept. 11, 28 days	3rd Sept. 11- Sept. 25, 14 days	4th Sept. 25- Oct. 9, 14 days	5th Oct. 9- Oct. 23, 14 days	6th Oct. 23- Nov. 6, 14 days	7th Nov. 6- Nov. 20, 14 days	8th Nov. 20- Dec. 3, 13 days
1	lb. 0-42	lb. 0-80	lb. 1-14	lb. 1-33	lb. 0-77	lb. 0-99	lb. 0-94	lb. 1-11
2 ¹	0-37	0-85	0-97	0-93	0-50	0-58	0-61	0-87
3 ¹	0-29	0-66	1-18	1-14	0-55	0-89	0-83	1-00
4	0-46	0-84	1-42	1-15	0-71	1-00	0-72	0-73
5	0-53	0-83	1-29	1-28	1-28	0-95	1-33	1-40
6	0-20	0-76	0-82	0-88	0-65	0-55	0-59	0-61
7	0-19	0-75	1-03	0-88	0-81	0-86	0-78	0-97
8	0-27	0-68	0-86	1-10	0-83	0-55	0-71	0-53
9	0-26	0-81	1-14	0-83	0-83	0-86	0-91	0-92
10	0-90	1-34	1-91	1-52	1-86	1-63	1-44	1-75
11	0-84	1-33	2-04	1-72	1-75	1-81	1-67	1-98
12	1-07	1-60	1-59	1-16	1-57	1-80	1-56	1-26

¹ These pigs were not included in averages here or elsewhere.

TABLE III.

Average Daily Rations per Pig at Different Stages of the Experiment.

Lot No.	Barley lb.	Sharps. lb.	Wheat. lb.	Oats. lb.	Beans. lb.	Pesa. lb.	Raw Potatoes. lb.	Cooked Potatoes. lb.	Whey. lb.	Sep'd Milk. lb.
(a) <i>Average Daily Ration per Pig for First Four Weeks.</i>										
1	1-37	1-37	—	—	—	—	—	—	—	—
2	1-25	—	1-25	—	—	—	—	—	—	—
3	1-25	—	0-62	0-62	—	—	—	—	—	—
4	1-25	—	0-62	—	0-62	—	—	—	—	—
5	1-25	—	0-62	—	—	0-62	—	—	—	—
6	1-25	—	1-0	—	—	—	1-0	—	—	—
7	1-25	—	1-1	—	—	—	—	1-1	—	—
8	1-25	—	0-9	—	—	—	1-5	—	—	—
9	1-4	—	1-0	—	—	—	—	1-75	—	—
10	1-4	—	0-75	—	—	—	—	—	9-1	—
11	1-4	—	0-75	—	—	—	—	—	—	4-5
12	1-6 lb. mixed meal ¹	—	—	—	—	—	1-5	—	—	5-0

¹ Consisting of equal parts barley, wheat, oats, beans and peas.

TABLE III—continued.

Average Daily Rations per Pig at Different Stages of the Experiment.

Lot No.	Barley lb.	Sharps. lb.	Wheat. lb.	Oats. lb.	Beans. lb.	Peas. lb.	Raw Potatoes. lb.	Cooked Potatoes. lb.	Whey. lb.	Soy's Milk. lb.
(b) Average Daily Ration per Pig for 9th to 12th Weeks.										
1	2.6	1.75	—	—	—	—	—	—	—	—
2	2.1	—	1.5	—	0.15	—	—	—	—	—
3	1.8	—	0.9	0.8	0.3	—	—	—	—	—
4	2.5	—	1.1	—	1.1	—	—	—	—	—
5	2.1	—	1.0	—	0.1	1.0	—	—	—	—
6	2.5	—	1.8	—	—	—	1.6	—	—	—
7	2.1	—	1.5	—	—	—	—	1.5	—	—
8	2.4	—	1.6	—	—	—	2.4	—	—	—
9	2.1	—	1.4	—	—	—	—	2.2	—	—
10	3.2	—	1.5	—	—	—	—	—	12.0	—
11	3.25	—	1.6	—	—	—	—	—	—	6.0
12	4.2 lb. mixed meal ¹				—	—	1.5	—	—	8.0

(c) Average Daily Ration per Pig for Last Four Weeks.										
1	4.6	1.1	—	—	1.1	—	—	—	—	—
2	3.1	—	0.8	—	0.9	—	—	—	—	—
3	3.1	—	0.8	1.25	0.9	—	—	—	—	—
4	4.75	—	0.7	—	1.0	—	—	—	—	—
5	4.8	—	0.7	—	0.3	0.6	—	—	—	—
6	3.25	—	0.8	—	0.75	—	1.5	—	—	—
7	3.75	—	0.8	—	0.75	—	—	1.5	—	—
8	3.25	—	0.8	—	0.75	—	2.5	—	—	—
9	3.75	—	0.8	—	0.75	—	—	2.5	—	—
10	6.1	—	1.0	—	0.6	—	—	—	7.5	—
11	7.2	—	0.9	—	—	—	—	—	—	3.75
12	6.4 lb. mixed meal ¹				—	—	—	1.5	—	5.0

(d) Total Foods Consumed During Whole Experiment (Average per Pig).										
1	382	199	—	—	50	—	—	—	—	—
2	302	—	158	—	45	—	—	—	—	—
3	274	—	105	123	53	—	—	—	—	—
4	387	—	114	—	125	—	—	—	—	—
5	351	—	111	—	19	100	—	—	—	—
6	325	—	165	—	39	—	187	—	—	—
7	314	—	161	—	39	—	—	185	—	—
8	326	—	154	—	39	—	292	—	—	—
9	327	—	155	—	39	—	—	306	—	—
10	478	—	169	—	28	—	—	—	1427	—
11	535	—	171	—	—	—	—	—	—	730
12	258	—	82	82	74	74	142	62	—	882

¹ Consisting of 40 per cent. barley, 17½ per cent. wheat, 17½ per cent. oats, 12½ per cent. beans and 12½ per cent. peas.

² Consisting of 60 per cent. barley, 12 per cent. wheat, 22 per cent. oats, 8 per cent. beans and 8 per cent. peas.

TABLE IV.

Average Prices of Foods Used.

	£	s.	d.
Barley, per ton	10	18	0
Sharps	9	5	0
Wheat	12	10	0
Oats	15	15	0
Beans	9	18	0
Peas	12	10	0
Potatoes (estimated)	2	10	0
Whey, per gallon (estimated)	0	0	1
Separated Milk, per gallon (estimated)	0	0	2
Average cost of labour per pig for 20 weeks.	0	5	0

TABLE V.

Particulars of Pigs Sold December 3.

Lat. No.	No. of Pigs Sold	Live Weight, Dec. 3rd		Carcass Weights		Percentage of Carcass to Live-Weight		Remarks
		Average	Range	Average	Range	Average	Range	
		lb.	lb.	lb.	lb.	%	%	
1	7	206-8	163-255	142-3	116-177	68-7	66-5-70-2	Fat, firm and white.
2	2	303	195-211	132-5	123-136	65-3	64-4-66-1	Do.
3	4	187	173-190	132-8	118-142	71-0	70-3-72-5	Do.
4	7	189-3	163-210	131-7	109-149	69-4	68-9-71-7	Fat inclined to be soft.
5	8	214-8	166-271	154-8	114-195	71-9	63-7-75-8	Do.
6	2	193	187-199	142-0	136-148	73-6	72-7-74-4	Fat firm and white.
7	3	200-3	182-228	143-7	133-162	71-7	70-1-73-1	Do.
8	3	228	200-256	172-5	163-192	75-7	75-0-76-5	Do.
9	6	201	163-285	142	115-178	70-6	67-2-75-2	Some soft, others firm.
10	8	265-6	243-300	193-6	177-220	72-8	71-5-75-0	Inclined to be too fat, especially over shoulder.
11	10	278-4	237-312	205-2	175-235	74-34	70-0-81-1	Fat firm and white. Shoulders biggish and fat.
12	8	253-3	234-309	189-5	163-220	71-9	67-0-79-3	Fat firm and white.

TABLE VI

Subsequent Records of Pigs Remaining after Experiment.

Lot No.	Pig No.	Average Daily Gain for 10 weeks before Dec. 3, 1923	Average Daily Gain for 66 days after Dec. 3 (Dec. 3, 1923, to Feb. 8, 1924)	Average Daily Gain for 41 days after Feb. 8 (Feb. 8 to Mar. 2)
		lb.	lb.	lb.
1	6	0.52	1.15	0.93
	8	0.66	1.23	1.64
	10	0.74	1.64	—
2	2	0.65	1.70	—
	3	0.25	1.42	1.63
	4	0.66	2.09	—
	5	0.64	1.97	—
	6	0.03	1.09	2.30
	7	0.68	1.62	—
	8	0.26	1.59	1.93
	9	0.68	0.97	0.54
3	5	0.73	1.35	—
	6	0.25	1.21	1.30
	7	0.71	1.50	—
4	9	0.76	1.95	—
	7	0.43	1.85	1.32
	9	0.86	1.61	—
5	6	0.94	1.59	—
	7	1.12	1.90	—
6	2	0.35	2.08	—
	4	0.62	1.15	1.60
	5	0.29	1.97	—
	6	0.69	1.58	1.00
	7	0.83	1.44	—
	8	0.62	1.11	1.20
	9	0.64	1.35	1.10
	10	0.81	1.97	—
7	2	0.82	2.05	—
	4	0.73	1.80	—
	5	0.88	2.18	—
	8	0.48	1.29	1.15
	9	0.68	2.29	—
	10	0.90	2.02	—
	2	0.49	1.17	1.40
8	4	0.67	1.76	—
	5	0.60	1.39	1.35
	6	0.65	1.08	1.30
	7	0.65	1.56	1.56
	8	0.45	2.00	—
	10	0.71	1.98	—
	1	0.39	2.27	—
9	4	0.87	1.64	—
	5	0.57	1.61	1.51
	6	0.57	1.39	1.44
	10	0.57	1.39	—

CONTEMPORARY AGRICULTURAL LAW

I.—LEGISLATION.

THE year 1923 was productive of some very important Acts of Parliament affecting agricultural interests. The first to be noticed is the Agricultural Holdings Act, 1923 (13 & 14 Geo. 5, c. 9), which was passed on June 7, 1923, and came into force on the following July 7. It is, however, no new enactment, but merely a consolidation into one Act of the existing statute law on the subject which included the Agricultural Holdings Act, 1908; the Agricultural Holdings Act, 1913; the Agricultural Land Sales (Restriction of Notices to Quit) Act, 1919; Part II of the important Agriculture Act, 1920, and the Agriculture Amendment Act, 1921. The existence of so many Acts affecting the relations of landlords and tenants of agricultural land was somewhat bewildering and very inconvenient. It was high time, therefore, that the provisions of these various Acts which have already been noted in previous articles on Agricultural Law in the columns of this Journal should be consolidated and made available in one Act to which alone any inquirer need turn to ascertain the statute law on the subject. The Act of 1923 was passed as a purely consolidating statute and does not purport to alter or amend in any way any of the enactments which it incorporates. It was probably necessary to pass it as such in order to facilitate its course through Parliament, though it is to be wished that the opportunity could have been taken to clear up certain obscurities and remove certain hardships arising under the incorporated statutes. It was slightly amended by the Agriculture (Amendment) Act, 1923 (13 & 14 Geo. 5, c. 25), which was intended to meet difficulties arising in consequence of sales of land by owners of which the tenants may not have received notice. It provides that unless or until a tenant of a holding shall have received notice, that the original landlord has ceased to be so entitled, and also notice of the name and address of the person who has become entitled to the rents and profits of the holding, any notice, request, demand or other instrument served upon or delivered to the original landlord shall be deemed to have been served upon or delivered to the landlord of the holding. It is provided that this enactment shall be inserted in Section 57 of the Agricultural Holdings Act, 1923, as sub-section 4 thereof, and that the King's printer of Acts of Parliament shall so print it in all copies of the Act printed in the future. Therefore until some further alterations or amendments are made the Agricultural Holdings Act, 1923, with this addition, constitutes a code of the existing

statutory law affecting the relations of landlord and tenant in respect of agricultural holdings.

The Agricultural Holdings (Scotland) Act, 1923 (13 & 14 Geo. 5, c. 10), is a similar consolidating Act of the Acts relating to Scotland.

The Finance Act, 1923 (13 & 14 Geo. 5, c. 14), by section 11 relieves certain entertainments from entertainments' duty in a manner which should be of benefit to promoters and supporters of agricultural shows. It enacts (so far as is material for the present purpose) that entertainments' duty shall not be charged on payments for admission to an entertainment in respect of which it is proved to the satisfaction of the Commissioners of Customs and Excise (a) that the entertainment is provided by a Society, not established or conducted for profit; (b) that the Society by which the entertainment is provided is established solely or partly for the purpose of promoting the interest of any "industry"; (c) that the entertainment provided by such Society consists solely of an exhibition of the products of the industry for promoting the interest of which the Society exists, or of materials, machinery, appliances or foodstuffs used in the production of those products, or displays of skill by workers in the industry in work pertaining to the industry, or consists of such exhibitions or displays of skill together with a performance of music by a band. In this section "industry" is defined as including a branch of an industry and including agriculture. "Agriculture" is defined as including horticulture and live stock breeding; and "live stock" as including animals of any description. Section 27 of the same Act enlarges the times for appealing by an occupier or owner of property assessed under Section 32 of the Finance Act, 1922, for income tax under Schedule A, or of inhabited house duty, if notification of the value so assessed was not delivered to him until April 5, 1925. Section 28 amends the allowances for repairs made by Rule 7 of No. V. in Schedule A to the Income Tax, 1918, in respect of houses or buildings, except a farmhouse or building included with lands in an assessment.

The Railway Fires Act (1905) Amendment Act 1923 (13 & 14 Geo. 5, c. 27) substitutes £200 for £100 as the maximum sum recoverable for damage to agricultural land or agricultural crops caused by fire arising from sparks orinders emitted from any locomotive engine and provides that notice in writing of intention to claim must be sent to the railway company within seven days of the occurrence of the damage and particulars in writing as to the amount of the claim within twenty-one days.

The Rent and Mortgage Interest Restrictions Act, 1923 (14 Geo. 5, c. 32) prolongs the duration of the Increase of Rent and Mortgage Interest (Restrictions) Act, 1920, and

amends it in several particulars, but the only amendment that need be noticed here is that it is no longer necessary when a dwelling-house is required by a landlord or his tenant for occupation by a person in his whole-time employment, to show that the employee is already in the landlord's or tenant's employment. The provisions of the section will be available where the landlord or tenant can prove that a contract for employment of a person has been entered into conditional on housing accommodation being provided for him. The whole of the provisions for orders for recovery of possession are, however, now made conditional upon the Court, before whom the matter comes, considering it "reasonable" to make such an order.

The Agricultural Credits Act, 1923 (13 & 14 Geo. 5, c. 34) was passed to facilitate the advance of money and the grant of credit for certain agricultural purposes, and to amend the improvement of Land Act, 1864. By Section I it authorises the Public Works Loan Commissioners to lend money to approved associations for the purpose of making advances upon certain mortgages. A mortgage upon which such advance may be made must comply with the following conditions: (a) the borrower must be a person who has agreed to purchase the land comprised in the mortgage not earlier than April 5, 1917, nor later than June 27, 1921, or the heir, devisee, or personal representative of such person; (b) the land comprised in this mortgage must be agricultural land; (c) the amount secured by the mortgage must not exceed 75 per cent. of the value of the land mortgaged at the date when the advance or transfer is made, or exceed an amount equal to thirty times the annual value of the land as ascertained for the purposes of Schedule A; (d) the rate of interest must not exceed such rate as the Treasury may prescribe; (e) the amount secured with interest must be repayable within a period of sixty years by equal yearly or half-yearly instalments of the principal sum advanced together with interest on the amount outstanding, or by equal yearly or half-yearly payments of principal and interest combined; (f) the land must be freehold or copyhold land free from any incumbrance affecting it in priority to the mortgage other than a land improvement charge or other charge to which priority is given by Act of Parliament. This section is intended to assist tenants and others who have purchased farms while the high prices caused by the war prevailed and who have since suffered by the general fall in prices. Section 2 empowers the Minister of Agriculture and Fisheries to take steps to promote the formation or extension of agricultural credit societies, that is to say, societies approved by the Minister and registered under the Industrial and Provident Societies Act, 1893, having for their object,

or one of their objects, the making of advances to members of the Society repayable within a period not exceeding five years for such agricultural purposes as may be approved by the Minister. The Minister is, by the same section, empowered within three years after the passing of the Act, or during such further period as the Treasury may prescribe to make advances to any such Society. Section 3 amends the improvement of Land Act, 1864, by providing that notwithstanding any provision in that Act limiting the rate of interest payable under a charge payable under such Act, the rate of interest may be such as the Minister may from time to time authorise, also that where an application is made under any existing Land Improvement Act for sanction of a charge on any lands in respect of the erection or improvement of a farmhouse or of a cottage for occupation by a person engaged in cultivation of the lands, the Minister may, if satisfied that the erection or improvement is required for the proper cultivation of the land, sanction the charge although it may not be shown that the work will effect a direct yearly increase in the value of the land exceeding the yearly amount proposed to be charged thereon. By Sub-section 4 of the same section the enumeration of improvements contained in Section 9 of the Improvement of Land Act, 1864, is extended so as to comprise the improvements authorised in relation to settled land by the Settled Land Acts, 1882 to 1922, which expression includes Part II of the Law of Property Act, 1922, amending the Settled Land Acts. This adds very largely to the matters which come within the scope of the Act and for which advances may be obtained, for instance, residential houses for bailiffs, woodmen, gamekeepers, boring for water, structural additions and alterations to buildings, gasometers, dynamos, works for the installation of electric light, etc., are now included.

The Agricultural Rates Act, 1923 (13 & 14 Geo. 5, c. 39) extends the exemption of agricultural land from rates conferred by the Agricultural Rates Act, 1896, and makes the occupier of such land henceforward liable for one quarter only of the rate in the pound payable in respect of buildings and other hereditaments, with a proviso that notwithstanding any provision contained in any other enactment for assessing agricultural land to any rate at less than the rateable value thereof (e.g., the Public Health Act, 1875) an occupier of agricultural land shall not, as compared with an occupier of buildings or other hereditaments, pay any rate in a less proportion than one quarter. By Section 2 the consequent deficiency in the rates, arising by reason of the foregoing provision, is to be made up by a grant from the Exchequer. By Section 4 the relief given by any enactment by virtue of which an occupier of land

in England which is used as arable, meadow or pasture ground only, is liable to be assessed to any rate in the proportion only of one quarter, is extended to give the same relief to occupiers of agricultural land within the meaning of the Agricultural Rates Act, 1896, which gives a wide definition of "agricultural land" as including "any land used as arable, meadow, or pasture ground only, cottage gardens exceeding one quarter of an acre, market gardens, nursery grounds, orchards, or allotments." By Section 5 the relief to occupiers of agricultural land granted by the Act of 1896, as amended by the Act of 1923, is not to be taken into account by an arbitrator in determining for the purposes of Section 12 of the Agricultural Holdings Act, 1923, what rent is properly payable in respect of a holding.

The Workmen's Compensation Act, 1923 (13 & 14 Geo. 5, c. 42) amends the Workmen's Compensation Act, 1906, by enlarging the employers' liability thereunder and in other respects. It increases the amount payable on the death of a workman leaving children dependent on him, limits the total amount so payable to £600 instead of £300, and increases the minimum amount of compensation in fatal cases from £150 to £200. In non-fatal cases £1 10s. is substituted for £1 as the maximum amount of the weekly payment. Compensation is to be payable, if the injury disables the workman for more than three days from earning full wages, from the fourth day of incapacity, and when the incapacity lasts four weeks or more compensation is also payable in respect of the first three days. It also provides that the want of or any defect or inaccuracy in the notice of an accident required by Section 2 of the principal Act shall not be a bar to the maintenance of proceedings for the recovery of compensation if the employer is proved to have had knowledge of the accident from any source at or about the time of the accident. A power is given by Section 15 to review weekly payments payable in respect of an injury by accident when there have been fluctuations in rates of remuneration in the class of employment in which the workman was engaged at the date of the accident.

II.—DECISIONS OF THE COURTS.

1. *Labour.* Amongst the numerous cases under the Workmen's Compensation Act, 1906, there is only one that relates to a farm labourer. In an Irish case *Byrne v. Campbell* ([1923] 2 I. R. 106) where a farm labourer, whilst engaged in forking hay for his employer, kicked out of his way what appeared to him to be a screw or bolt, but what was, in fact, a detonator which exploded and caused injuries to the labourer resulting in the loss of the sight of one of his eyes, it was held that the accident arose "out of his employment" and that he was

entitled to compensation under the Act. It was supposed that the detonator had been left there by armed forces opposed to the Government who had camped in the yard.

In *Re Daniels* (92 L.J.K.B., 229) a case under the Unemployment Insurance Act, 1920, it was held that a person employed by a firm of seed growers and merchants as a pea and bean sorter is a person employed in "agriculture" (an excepted employment) within the meaning of Part II (a) of the First Schedule to the Act and is therefore not insurable.

2. *Stock*. In *Manton v. Brocklebank* (92 L.J.K.B., 624; [1923] 2 K.B., 212) the decision of the King's Bench Division noted in this Journal (see R.A.S.E. Journal Vol. 83, p. 137) was reversed. It was a case where the plaintiff and defendant agisted horses with a farmer, and the defendant without notifying the plaintiff placed a strange mare, which he had bought with a warranty that she was quiet, in the field where the plaintiff's horse already was. The mare had been previously agisted with other horses without causing any trouble, and the plaintiff knew that other horses were liable to be agisted in the same field as his horse was. On this occasion the mare kicked the plaintiff's horse and broke its leg so that it had to be destroyed. The Divisional Court held the owner of the mare liable to the plaintiff for the loss of his horse on the ground that the mare had only done what the defendant had reason to expect she might do by reason of the nature of mares under such circumstances, and it was unnecessary to prove that the mare was of a vicious disposition to the defendant's knowledge. The Court of Appeal, however, over-ruled this, and held that the fact that biting or kicking might take place after the mare had been turned into the field was not enough to put the defendant in the position of an owner of a dangerous animal, and there was no ground for bringing this mare within the class of dangerous animals which an owner must keep at his peril. There being no negligence shown on the part of the defendant he was not liable for the injury.

Fraser v. Pate ([1923] S.C., 748) was a Scottish case where it was expressly observed that the English law applicable did not differ from the Scots law. A motor-cyclist who was injured by a collision in daylight with a sheep upon a public road brought an action of damages against the farmer from whose field the sheep had strayed, and averred that the farmer was negligent in that he had knowingly failed to keep his fences in such repair as would prevent his sheep from straying in the road, and in any event that he was negligent in allowing his sheep to graze upon the road. It was held that these averments were irrelevant as the accident was not the natural and probable result of the negligence alleged, and therefore the defendant was not

liable. The Court in so deciding followed the English decision of *Heath's Garage Limited v. Hodges* (85 L.J.K.B., 1289; [1916] 2 K.B., 370) where a similar accident happened to a motor-car which collided with some stray sheep in the road, and it was held that the farmer who owned the sheep, which had escaped from their field owing to an insufficient fence, was not liable for the damage caused.

In *McCreagh v. Cox* (92 L.J.K.B., 855) it was held that the exemption from distress of "beasts that gain the land" in the old Statute 51 Hen. 8, does not apply to a distress for poor rates, and therefore that a seizure of two horses and a wagon engaged in harvesting under a warrant of distress issued in consequence of the plaintiff's refusal to pay rates on the occupation of certain lands was not unlawful.

In *British Oil & Cake Co. v. Burstall & Co.* (39, Times L.R., 406) copra cattle cake was sold by one Bowring to Rayner, who resold it to Burstall, who resold it to the plaintiffs, stating that it was "free from castor." In fact it had a large quantity of the deadly castor bean in it. It was sold to various distributors, and when given to cattle by farmers caused serious illness. The farmers claimed damages from the plaintiffs who settled the claims, and then claimed damages from Burstall, and Burstall claimed from Rayner, and Rayner from Bowring. It was held that the damages were not too remote, and as the real character of the article was not patent the plaintiffs were entitled to deal with it on the assumption that it was the article contracted for, and therefore they could recover from Burstall all the damages claimed, including compensation paid to sub-purchasers. Burstall similarly would recover from Rayner and Rayner from Bowring.

3. *Landlord and Tenant.* There has again been a large number of landlord and tenant cases chiefly arising out of the provisions of the Agriculture Act, 1920, which now form part of the Agricultural Holdings Act, 1923. The first which should be noticed is *Edell v. Dulieu* (92 L.J.K.B., 559; [1923] 2 K.B., 247, in H.L., 40, Times L.R. 84). The decision of the King's Bench Division, which was stated in Vol. 83 of this Journal, at p. 142, to have been to the effect that Section 28 of the Agriculture Act, 1920 (now Sect. 25 of the Agricultural Holdings Act, 1923), making less than a twelve months' notice to quit a holding invalid, applied only to yearly tenancies, and not to a notice to terminate a lease for twenty-one years under a power to determine at the end of seven or fourteen years by a six-month's notice, has since been reversed in the Court of Appeal, whose decision has been upheld by the House of Lords. So it must now be regarded as settled law that section 25, avoiding a notice purporting to terminate a tenancy before the expiration of twelve months from the end of the current year

of tenancy, applies to all contracts of tenancy of agricultural holdings whether for years or from year to year.

Jones v. Evans (92 L.J.K.B., 35; [1923] 1 K.B., 12) is a very important case. By Section 16, Sub-section 1, of the Agricultural Holdings Act, 1923, differences arising out of claims by tenant against landlord or landlord against tenant on the termination of the tenancy are to be determined by arbitration, and by Sub-section 2 any such claim shall cease to be enforceable after the expiration of two months from the termination of the tenancy "unless particulars thereof have been given by the landlord to the tenant, or by the tenant to the landlord, as the case may be, before the expiration of that period." A statement was delivered within the two months of a landlord's claim against a tenant for various dilapidations and breaches of agreement in somewhat general terms, e.g., "for neglect or failure to keep the dwelling-house, cow-house, stable, pigstyes, cattle-shed, the loft of the old house, and the premises generally in substantial repair," and "for failure to cultivate the said farm and lands in a good husbandlike manner according to the custom of the country." It was objected that these were not sufficient particulars to enable the landlord's claim to succeed. The Court of Appeal held that having regard to the severity of the penalty for not giving the particulars in time—viz: the unenforceability of the claim—and having regard to the fact that the particulars need not be given in writing, the requirement as to particulars to be given by landlord or tenant is not to be construed strictly, and that it is in general sufficient if the document or conversation which contains the particulars gives an indication to the other party of the particular kind of claim which is going to be made, even though such particulars may have to be amplified when the parties get before the arbitrator.

In *Huckell v. Saviny* (92 L.J.K.B., 313; [1923] 1 K.B., 150) it was held that a tenant is not entitled to compensation for any improvement which he is bound by his contract of tenancy to make (in that case the planting of fruit trees and bushes) if the contract of tenancy was made before January 1, 1921. In respect of a contract of tenancy made after that date the law has now been altered by Section 1 of the Agriculture Act, 1920, and the Agriculture (Amendment) Act, 1921, which are reproduced in Section 1 of the Agricultural Holdings Act, 1923.

In *Swinburne v. Andrews* (92 L.J.K.B., 889; [1923] 2 K.B., 483) a landlord had let a farm according to the custom of the county (Durham) upon a yearly tenancy as to the greater part of the land from April 6 and as to the remainder of the land, farmhouse, yard, gardens and outbuildings, from May 13, and it was provided that on the termination of the tenancy he should,

on April 6, give up possession of the whole of the farm excepting the land required for the away-going crop, the farmhouse and outbuildings with certain grass-fields which he should retain until May 13. It was held that the "termination of the tenancy" for the purpose of giving the notice required by Section 12, Sub-section 7, of the Agricultural Holdings Act, 1923, of intention to claim compensation for disturbance took place on May 13 notwithstanding that the main portion of the farm had to be surrendered at an earlier date.

Cave v. Page (87 S.J., 659) was rather a different case. There the tenancy was determined by notice to quit duly served on the tenant to expire on March 25, 1920, but the tenant wrongfully held on until he was removed in January, 1921, under an order of the Court made in ejectment proceedings instituted by the landlord. It was held that from March 25, 1920 he was not holding under the contract of tenancy and the land which he occupied was not a holding within the Act; consequently a claim which should have been made within three months of his quitting the holding under the Agricultural Holdings Act, 1908, was not duly made and could not be entertained if made more than three months after the time when he ought to have quitted, although less than three months after his ejectment.

On the other hand, in *Mills v. Rose* ([1923] W.N., 330) it was held that a tenant who has received a notice to quit and does not quit the whole holding at the expiration of the notice, but holds on to part until he is ejected by a writ of possession, yet quits the holding "in consequence of the notice to quit" within the meaning of Sub-section 1 of Section 12 of the Agricultural Holdings Act, 1923, which deals with, and gives the right to, compensation for disturbance.

In *Arden v. Rutter* (92 L.J.K.B., 894; [1923] 2 K.B., 865) a question arose under Section 19 of the Agriculture Act, 1920 (now Section 10 of the Agricultural Holdings Act, 1923). This section allows a landlord to claim for deterioration of the land owing to the failure of the tenant to cultivate according to the rules of good husbandry, but as a condition of this claim he must give notice in writing of his intention to claim before the termination of the tenancy. The tenancy agreement in this case bound the tenant to clear out all ditches and drains when required and to cultivate the land properly. The landlord claimed compensation for deterioration of the farm by reason of the failure of the tenant to observe the conditions of the agreement, but he gave no notice of his intention to claim before the termination of the tenancy. It was held, reversing the decision of a County Court Judge, that he was entitled to make his claim notwithstanding the absence of a previous notice, because under the somewhat ambiguous wording of the

section the requirement of notice had reference to a claim merely under the provisions of the Act and not to a claim under the provisions of the contract of tenancy.

Masters v. Duveen (93 L.J.K.B., 57; [1923] 2 K.B., 729) was an important case under Section 42 of the Agriculture Act, 1920 (Agricultural Holdings Act, 1923, Sect. 48) relating to market-garden land. That section, as it may be remembered, gives the right to compensation for planting of fruit trees and fruit bushes and the other market-garden improvements mentioned in the Third Schedule to the Act, where it has been agreed in writing that the holding shall be "let or treated as a market-garden." The tenancy agreement described the tenant as a "market-gardener" and provided that he was to cultivate the land "in the best and most approved system of gardening," but also contained a proviso that "nothing herein contained shall be deemed to be an agreement by the landlord that the premises hereby demised or any part thereof shall be let or treated as a market garden, or give rise to a claim for compensation for fruit trees or bushes under the Agricultural Holdings Act, 1908." It was proved that the holding had in fact been cultivated as a market garden and the tenant on the termination of his tenancy claimed compensation for market garden improvements under the Third Schedule. It was held that he was not entitled to such compensation as it could not be said in the face of the proviso, which negatived any such agreement, that it had been agreed that the holding should be let or treated as a market garden. It was argued that the proviso was void as contravening Section 5 of the Act (Agricultural Holdings Act, 1923, Sect. 50), by which it is provided that an agreement by which a tenant gives up his right to compensation shall be void, but the Court said that it was begging the question as it had first to be shown that he had the right, which was held not to be the case. The decision being one of the Court of Appeal must be treated as correct, though it may be humbly suggested that the Court did not attach sufficient weight to the words "let or treated" as a market garden, as it seems fairly clear that the agreement provided that it should in fact be so treated.

In *Cheshire County Council v. Hopley* (21 L.G.R., 524) the County Council being landlord of certain small holdings agreed on December 24, 1915, to let a certain holding to the defendant who agreed to pay "on entry" any allowance or compensation which "may" be due to the outgoing tenant in respect of feeding stuffs, or manures, or improvements mentioned in Part III of the First Schedule to the Agricultural Holdings Act, 1908. He entered into occupation of the land on February 2, 1916, but it was not until February 11, 1918 that the amount

of compensation payable by the Council to the outgoing tenant was arrived at, and the Council did not pay that amount until March 17, 1921, viz., more than six years after the tenant's entry on the holding. On January 13, 1923, the Council sued the defendant for the sum they had paid and he pleaded that the cause of action had arisen on February 2, 1916, when he had entered on the holding and was barred by the Statute of Limitations as more than six years had elapsed since, as he alleged, the sum became due. It was held that the claim was not so barred as nothing became due from the Council to this outgoing tenant until the amount had been ascertained, which was not the case until February 11, 1918.

Queen's Club Garden Estates, Limited v. Bignell (93 L.J.K.B., 107) is an important case in which it was decided, notwithstanding a previous decision to the contrary, that in the case of a weekly tenancy a week's notice to quit is a reasonable and proper notice and that it must be given to terminate on the last day of a week calculated from the beginning of the tenancy.

1. *Produce.* There is one case on the sale of milk which should be noticed. In *Wildridge v. Ashton* (93 L.J.K.B., 30; [1924] 1 K.B., 92) the respondent was charged with selling milk not of the nature, substance and quality demanded. The facts were that the respondent had sold 36 imperial gallons of milk which were delivered at a railway station at Hull in three churns, one containing 12 gallons, the second 14, and the third 10 gallons. The inspector took samples from each of the three churns but he did not mix the whole 36 gallons together, nor when he had taken a sample from each of the three churns did he mix the samples together, but keeping them separate obtained a separate analysis of each. Evidence was given to prove that when these three separate analyses were fairly regarded, and their average taken as representing the quality of the milk, the method adopted was at least as accurate as taking a sample from the whole milk if mixed together before the sample was taken. The analysis showed that two samples of the milk contained 4.3 and 4.4 parts by volume of moist sediment per 100,000 parts of milk, such sediment consisting mainly of dung. The third certificate showed that the milk in the third sample contained 2.7 parts by volume of moist sediment per 100,000 parts of milk, such sediment consisting partly of dung. It was contended on behalf of the respondent that the whole method of mixing was faulty because the samples were taken from each of the churns and separately analysed, and that having been so taken they should have been mixed together before analysis. It was held that there was no ground for that proposition for the evidence was that the result arrived at from the three analyses was at least as accurate as the result would have been if arrived

at by taking a sample from the whole bulk if mixed together. *Johnston (Paton's Trustee) v. Finlayson* ([1923] S.C., 872) was a Scottish case relating to a sale of growing crops of potatoes by a farmer to a potato merchant. The farmers did all the work required to bring the crops to maturity, and the merchant employed and paid for the labour of lifting the potatoes, pitting them on the farm and dressing them. It was a term of the contracts that the horse-work for lifting and carting the potatoes to pit and to rail should be provided by the farmers. The merchant became bankrupt while the crops were in the pits, the purchase prices being then wholly or in part unpaid. In a question between the trustee in bankruptcy and the farmers it was held that while the property in the potatoes had passed when the bankrupt by his servants had lifted the potatoes, he had not by this operation obtained possession of them, and accordingly that the farmers under Section 40 of the Sale of Goods Act, 1893, had a right of lien as unpaid sellers for the unpaid purchase-money over the potatoes remaining on the farms.

5. *Miscellaneous.* *Syan v. Sinclair* ([1924] W.N., 5) was an interesting case on the difficult question of what will amount to an abandonment of an easement of right of way. It was held that mere non-user is not conclusive evidence of abandonment, but non-formation or user of the way and continuous obstruction of the site without complaint for upwards of fifty years was held to be sufficient for the Court to infer abandonment.

In *Anderson Limited v. Daniel* (40 Times L.R., 61) a case arose under the Fertilisers and Feeding Stuffs Act, 1906, which requires, on a sale for use as a fertiliser of the soil of any article imported from abroad, an invoice to be given to the purchaser stating the percentages (if any) of nitrogen, soluble phosphates, insoluble phosphates, and potash contained in the article. The sale was of what is known to the trade as "salvage," as a fertiliser of the soil. It consisted of sweepings from vessels which had been carrying from abroad cargoes of nitrate of soda, sulphate of ammonia, superphosphates and other artificial manures. No invoice was given at the time of sale or afterwards. The price at which the goods were sold was below that of ordinary manures. In an action to recover the price of the goods it was held that failure to comply with requirements of the Statute prevented the vendor from recovering the price of the goods unless they had a reasonable excuse for such failure, and that the fact that the goods were sold as a fertiliser at a price which made it not commercially worth while to analyse for the purpose of giving the purchaser the required information was not a reasonable excuse for the failure.

Nicholls v. Tavistock Urban Council (92 L.J.K.B., 233; [1923]

2 Ch. 18) was a case relating to markets. The Tavistock Urban Council were owners of an ancient cattle and other market which formerly belonged to the Duke of Bedford. A by-law adopted by the Council empowered them to prohibit sales by auction in the market from being held without the consent of the superintendent, collector, inspector of the markets or his assistants. It was held that this by-law was invalid as being a prohibition against sales by auction in a public market, and therefore an infringement of the common law rights of the public in such a market.

In *South Eastern Railway v. Cooper* (21 L.G.R., 439) the railway company had many years ago granted to the owners of an adjoining farm a right of crossing over a portion of the company's railway line. The present owner of the property proposed to work a sand and gravel pit and to use the crossing for the conveying of the sand and gravel from the sand-pit which was on the north side of the crossing to the land on the opposite side. It was held in an action by the railway company that the right of passage had been granted merely as an accommodation work, the extent of the user of which must be measured by and restricted to the purposes for which the crossing was required at the date of the grant, and that the defendant was not entitled to use the level-crossing in such a way as substantially to increase the burden of the easement by altering or enlarging its character by the constant crossing of carts for the conveyance of sand and gravel.

AUBREY J. SPENCER.

15, Old Square,
Lincoln's Inn,
W.C.

AGRICULTURAL STATISTICS, 1923.

(The Society is again indebted to the Ministry of Agriculture and Fisheries for its kindness in supplying, for inclusion in the JOURNAL, the usual detailed and comparative tables of the latest agricultural statistics. For fuller information than can be given in the small space available here, the Department's own admirable series of Reports on Agricultural Statistics should, of course, be consulted.—Ed.)

ACREAGE.

PARTICULARS of the acreage under the various crops and of the number of live-stock are given in Table I.

The steady decline in the total area under cultivation in

England and Wales¹ which had been proceeding since 1891, although temporarily arrested during the war, has subsequently received increased momentum. Including the reduction of 83,000 acres in the area under crops and grass in 1923, the total amount of land withdrawn from cultivation since 1917 is over 1,000,000 acres as compared with a loss of 300,000 during the decade 1904-1914. The post-war reduction in the total farming area has not, however, been accompanied by the persistent gain of permanent grass at the expense of arable land, which was so significant a feature of the agricultural returns for the thirty years 1885-1914, during which period the area under permanent grass increased from 14,000,000 to 16,000,000 acres.

Despite the heavy shrinkage in the total area under crops and grass since the war, the extent of pasture has increased since 1918 by only 200,000 acres, and is now 1,400,000 acres below the 1914 level. It is interesting to note that for every 100 acres of arable land, there were, in 1914, 160 acres of permanent grass, in 1918, 118 acres, and in 1923, 132 acres.

All corn crops showed a heavy decline in acreage from 1922. *Wheat*, which in that year was returned as covering 1,967,000 acres, occupied in 1923 only 1,740,000 acres—a decrease of 227,000 acres, or 12 per cent. The 1923 acreage, however, was above that for several years before the war. In 1908 it stood at 1,583,000 acres and in 1913 at 1,701,000 acres. It may be interesting to recall that the lowest area under wheat ever recorded was 1,375,000 acres in 1904. The next largest reduction was in *Oats*, which declined from 2,164,000 acres in 1922 to 1,978,000 acres in 1923, and with the two exceptions of 1913 and 1914 the area was the smallest recorded since 1898. *Barley* showed a decrease over the 1922 figure of 37,000 acres, being recorded at 1,327,000 acres. This is the lowest area ever reached, with the exception of the 1915 crop, and is considerably below the pre-war level. In 1912, the area under barley stood at 1,457,000 acres or nearly 10 per cent above the 1923 figures. The effect of the impetus given to barley growing by the high prices at the end of the war (the area sown for the 1920 crop was over 1,500,000 acres) has thus completely disappeared. A comparatively small acreage decline is shown in *Rye*, although the corresponding percentage drop is considerable. The area under rye in 1923 (73,000 acres) was about 13 per cent. less than in the previous year, but was slightly in excess of the average of the ten years 1913-1922, and well above the area of the 1912 crop (54,000 acres).

The area under *Beans* showed a further fluctuation in 1923, although for purposes of reference Tables I and II give details also for the other parts of the United Kingdom, exigencies of space make it necessary to confine the review to England and Wales.

the increase of the previous year having been more than counter-acted by a decrease of 50,000 acres from 1922. The 1923 area of 235,000 acres is well below the pre-war figures, but is in excess of the low record of 211,000 acres in 1917. *Peas*, too, have declined, the 141,000 acres under cultivation in 1923 being less by 32,000 acres than in 1922. The present position is, however, more satisfactory than in 1914, when only about 130,000 acres were sown, and falls not far short of the high level reached in 1918 (150,000 acres). The combined area under the two pulse crops in 1923 was therefore 376,000 acres, as compared with 458,000 acres in the previous year, i.e. a decrease of 82,000 acres or about 20 per cent.

In spite of a reduction of 95,000 acres in 1922, the area under *Potatoes* (467,000 acres) was greater than in any year before the war, the pre-war maximum being 464,000 acres in 1905. After the drop in 1919 from the record war area of 630,000 acres, the potato area ranged between 545,000 and 561,000 acres during 1920-1922, and the 1923 area showed, therefore, the rather considerable shrinkage of about 90,000 acres, or 16 per cent. as compared with the previous three years.

The greatest change in the area under *Root* crops is in *Turnips* and *Swedes*, which increased by 41,000 acres from 1922. The area allocated to these crops has, however, been steadily diminishing for many years, and the acreage (862,000 acres) returned in 1923 is nearly 200,000 acres below the pre-war extent and hardly more than half that of thirty years ago. *Mangolds* show a decline of 20,000 acres, being returned at 403,000 acres. The total area of the root crop in 1923 was 1,265,000 acres, as compared with 1,244,000 in 1922 and 1,477,000 acres in 1914.

The area under *Clover* and *Rotation Grasses* was curtailed during the war, and fell to only just over 2,000,000 acres in 1918, but the 2,600,000 acres recorded for 1923 is the highest area since 1911, and represents an increase of 298,000 acres or 13 per cent. over 1922. The increase in the area averaged 60 per cent. in the Eastern counties and 20 per cent. in the North-eastern and South-eastern counties.

The acreage under *Vetches* and *Tares* fell by 49,000 acres from 1922 to 1923, the figure now standing at 87,000. It is thus considerably below the 124,000 acres recorded for 1914. The acreage of *Hops*, which had been steadily regaining its pre-war extent, received a set-back in 1923, the growers having heeded the warnings as to the effect of the decline in the consumption of beer. The total area in 1923 was 24,893 acres (of which 15,460 acres were in Kent), a decline of 1,600 acres compared with the previous year and of nearly 10,000 acres compared with 1914. Of the minor crops it is interesting to note that the

area (16,900 acres) used for *Sugar-beet* in 1923 was double that of the previous year.

LIVE STOCK.

All classes of *Horses* show a decrease over the 1922 figures, the total of 1,281,000 being 59,000 less than in that year, and 119,000 less than in 1914. The number of horses used for agricultural purposes (798,000) decreased by nearly 1 per cent., but is greater than the 791,000 of 1914. Stallions declined by 615 on the 1922 total of 5,000, and the reduction in the number of foals was heavier even than in 1921-1922. Only 66,000 of the latter class were returned, a decrease of over 17,000 or 20 per cent. on the year. Compared with 1920, the number was 32 per cent. less, and was 35 per cent. lower than in 1914. The fact that the number of mares kept for breeding declined from 111,000 in 1922 to under 85,000 in 1923, indicates that a still further diminution in the number of foals may be expected in 1924.

For the second year in succession a considerable increase is reported in the total head of *Cattle*. By 1921 the numbers had fallen by nearly three-quarters of a million from the 1917 record of 6,227,000, but the increase of 200,000 in 1922 and a further increase of 100,000 in 1923 have brought the total (5,823,000) up to the pre-war level. So far as the separate classes of cattle are concerned, it is noteworthy that the total number of cows and heifers (in milk or in calf) has passed all previous records, the figure of 2,615,000 being over half a million more than the average of thirty years ago. The 93,000 increase on 1922 was largely made up of an addition of 72,000 to the number of heifers in calf. The figures of the categories of other cattle suggest that the meat-producing side of the industry has not kept pace with that of the dairying. Although the number of cattle two years' old and above showed the satisfactory increase of 10 per cent. in 1923, the total of 938,000 is nearly 150,000 below the average of the four years 1911-1914, notwithstanding that the total head of cattle in those years was much the same as now. Both categories of young animals showed a slight decline in 1923, those one year and above decreasing by about 59,000 (5 per cent.), and calves by 29,000 (3 per cent.).

Although the total number of *Sheep* returned in 1923 (13,836,000) was 398,000 more than in the preceding year, it is still far below the 1914 level of 17,260,000. The category in which the largest increase occurred in 1923 was that of sheep of one year and over (excluding breeding ewes) which showed an addition of 232,000. Lambs totalled 5,806,000, i.e. 86,000 more than in 1922, but 10 per cent. below the average of the previous

ten years. Ewes kept for breeding increased by 77,000 to 5,505,000, i.e. 2,000,000 less than during 1908-11, when flocks as a whole reached an aggregate of 6,000,000 more than in the last four years.

The 1923 returns indicate a considerable stimulus to *Pig-breeding*. The total of 2,612,000 was 313,000 (14 per cent.) more than in 1922, and nearly 1,000,000 more than in the record low year of 1918. Sows kept for breeding increased in the year by 86,000 to 339,000, and bacon pigs rose to 2,197,000, i.e. an increase of over 222,000, or 11 per cent.

PRODUCTION OF CROPS.

Particulars of the production and yield per acre of the principal crops are given in Table II. The total production of *Wheat* in England and Wales in 1923 amounted to 1,522,000 tons, which, although showing a reduction consequent upon the reduced acreage, and being 150,000 tons less than in the previous year, was about equal to the average of 1912-1914. The average yield per acre was nearly $\frac{1}{2}$ cwt. higher than in 1922, and was nearly $\frac{1}{2}$ cwt. above the average of the previous decade. The total crop was, of course, a long way below that attained during the war, the extended acreage and splendid yield of 1918 having produced the bumper crop of 2,339,000 tons. *Barley*, despite the further reduction in acreage, showed a slight increase in production in 1923, the total crop in England and Wales of 965,000 tons being 9,000 tons above that of 1922, the increase being due to an improvement of $\frac{1}{2}$ cwt. in the average yield, which, however, was again below the average. The serious reduction in the area devoted to this crop compared with pre-war days is seen by the fact that the total quantity produced in 1923 was 185,000 tons (15 per cent.) less than the average of 1912-1914. Notwithstanding the considerable reduction in area, the crop of *Oats* in 1923 was 100,000 tons above that of 1922, the increase being accounted for by an improvement of over 2 cwt. per acre on the disappointing yield of that year. The yield of 14.1 cwt. per acre in 1923 was one of the best for many years past, being over $\frac{1}{2}$ cwt. above the ten-year average, and only slightly below that of the exceptional result of 14.5 cwt. in 1918.

The aggregate production of the three main corn crops in England and Wales in 1923 was 3,840,000 tons compared with 3,783,000 tons in 1922, but these results are far below the war record of 5,517,000 tons in 1918, and do not compare very favourably with the annual average production of 4,283,000 tons during the years 1912-1914.

Beans did very well in 1923, the yield improving by over

3 cwt. per acre on the comparative failure of 1922, and being $1\frac{1}{2}$ cwt. over the average in the last ten years. The improved yield set off the shrinkage of 50,000 acres in the area devoted to the crop, and resulted in the total production being about the same as in 1922.

The out-turn of *Peas* also recovered from the set-back in 1922, being 5 cwt. per acre better than the 9.3 cwt. of that year, and nearly 1 cwt. above the average of recent years. In the case of this crop the improvement in yield more than counter-balanced the restriction in acreage, with the result that the total crop in England and Wales was 68,000 tons (or nearly 20 per cent.) above that of 1922.

Although the *Potato* yield of 1923 showed the very disappointing result of only 5.9 tons per acre compared with the high figure of 7.2 tons in 1922, it was only slightly below the average of the previous ten years. The reduction over the 1922 yield was accompanied by a heavy shrinkage of 17 per cent. in the total acreage under the crop, and resulted in the production falling from 4,012,000 tons to 2,758,000, i.e. a drop of 1,254,000 tons. The supply of potatoes from the 1923 crop was the smallest since 1919, when it fell to 2,730,000 tons, the results of the other intervening years having been 3,150,000 tons in 1920 and 2,958,000 in 1921.

The weight per acre of *Turnips* and *Sweedes* in 1922, although nearly three-fourths of a ton below that of 1922, was well up to average. Following the excellent results of the previous year, the total crop showed a reduction, but this was off-set to a great extent by the increased acreage, the net decline compared with the 1922 production being less than 1 per cent. The big reduction in the area under these roots since pre-war days is reflected in the fact that the crop of 1923 was 2,000,000 tons less than the average of 1912-1914.

Mangolds were a poor crop in 1923, the yield per acre being 2 tons below that of 1922, and over $1\frac{1}{2}$ tons below the average of the previous ten years. Coupled with a reduction of 5 per cent. in the acreage, the result was that the total crop fell from 8,560,000 tons to 6,944,000, i.e. a reduction of 1,616,000 tons.

1923 proved an exceptionally good year for *Hay*, the yield from rotation grasses being 3 cwt. and from pasture $1\frac{1}{2}$ cwt., above the decennial average. Contrasted with the poor results of the 1922 crop the yield from rotation grasses increased by $8\frac{1}{2}$ cwt. and from pasture by 4 cwt. In the case of rotation grasses, the satisfactory crops, combined with the increase of nearly 500,000 acres in the area, resulted in an addition of over 1,000,000 tons to the total production. Although the area of permanent grass mown was reduced by 56,000 acres, the production of hay from that source increased by 800,000 tons. The

aggregate hay crop of 7,697,000 tons was nearly 1,900,000 tons (33 per cent.) greater than in 1922.

As will be seen from Table III the production of *Hops* fell in almost every area, the total for the year (229,000 cwt.) being 72,000 cwt. (24 per cent.) less than for 1922. The yield per acre dropped from 11·4 cwt. to 9·2 cwt. (20 per cent.) and was more than 1 cwt. below the ten-year average. The production in Kent declined by as much as 53,000 cwt. on the 206,000 cwt. of 1922, and the yield per acre fell from 12·3 to 9·9 cwt. Worcester showed an increase of 300 cwt. in the total yield, notwithstanding that the acreage declined by 4 per cent. It should be remembered that the production figures do not include the amount of hops left unpicked, which is larger than usual owing to the Hop Controller having advised each grower of the quantity he could take into control.

PRICES.

The index numbers prepared by the Ministry of Agriculture and Fisheries for the purpose of comparing changes in agricultural prices show that the prices of produce sold off farms during 1923 were on the average 57 per cent. higher than the pre-war level, as compared with 69 per cent. higher in 1922, 119 per cent. in 1921, and 192 per cent. in 1920. Although, therefore, the price index number fell by 12 points in 1923, the decline was comparatively small compared with that in the two previous years. As a matter of fact, the greater part of the fall between the index number for 1922 and that for 1923 occurred in the autumn of 1922, and the fall during 1923 itself was less than that apparently indicated by the annual figures, the percentage index number of 56 for the month of December being only three points below that of the preceding December.

In Tables IV and V are given the average prices of *British Corn* during each week of 1923, and the annual averages for each of the last ten years. It will be seen that the price of wheat in 1923 closed at the same figure as it opened in the January, the lowest and highest points throughout the year having been the fall to 8s. 9d. per cwt. at the end of September and the rise to 11s. 6d. at the end of July. Barley, opening at 9s. 5d. per cwt., tended to drop during the spring and summer, but rose again in the autumn to a maximum of 11s. 9d. in September, the closing price at the end of the year being 11d. per cwt. more than at the beginning. Oats showed a similar tendency to that of wheat in rising in the spring and early summer, and falling in the autumn, the figure at the close of the year, however, being 7d. less than at the commencement. Compared with 1922 the averages for the year as a whole fell by 1s. 4d. per cwt. in the case of wheat, 1s. 9d. in that of barley, and 10d. in that of oats. Although

prices have dropped heavily since the records of 1920, they are still over 20 per cent. above the 1914 level, oats particularly standing well at 2s. 1d. per cwt. more.

In Tables VI and VII are given the monthly average prices of fat stock and milking cows for 1923, and comparisons of the annual averages for the last ten years. *Cattle* prices showed the usual tendency to rise about May and fall again until the approach of the Christmas trade. The greatest variations in successive months were in the case of first-quality Short-horns, the live weight quotations of which fell by over 5s. per cwt. in July and jumped by 7s. in December. On the average of the year as a whole the dead weight prices of fat cattle were rather more than 1s. below those of 1922 as compared with a fall in that year of 5s. on those of 1921. The 1923 prices, however, ranged from 3s. to 4s. per stone dead weight more than in 1914, first-grade Devons realising 4s. 7d. per stone more. The prices of milking cows in 1923 were less than £3 per head below the average of 1922 as compared with the heavy fall, ranging from £11 to £15, in that year over 1921, and prices of first-quality animals remained more than 50 per cent. higher than in 1914.

The prices of fat *Sheep* followed the usual course of rising up to the beginning of spring and then falling to the time when lambs come on the market in the late summer. First-qualities in the case of Downs fell from 18½d. per lb. in April to 15½d. during July to September, in that of Longwools from 17½d. in April to 14d. in July, and Crossbreds from 18½d. in March to 15d. in September, and in all cases a recovery set in towards the end of the year. On the average of the year as a whole prices compared with 1922 fell by about 1d. per lb., except in the case of first-quality Downs, where the drop was 1½d. In comparison with 1914, prices of fat sheep remained higher than those of the other classes of fat stock, ranging on the average 6d. per lb. (or 70 per cent.) more than in that year.

Save for slight checks in August and September, prices of fat *Pigs* in 1923 showed a steady fall throughout the year. First-grade bacon pigs opening at 14s. 3d. per stone had fallen by July to 11s. 6d., and although recovering by 5d. by September, had dropped to 10s. 9d. by the end of the year. The same grade in porkers, which started at 16s. 4d. per stone, had fallen by July to 12s. 8d., the figure at which they closed in December, although a rise up to 13s. 3d. had taken place in September. Compared with 1922, prices for the average of 1923 as a whole fell in the case of first-grade bacon pigs from 14s. per stone to 12s. 3d., and in that of porkers from 15s. 7d. to 13s. 10d., which were, however, much smaller drops than the 3s. and 7s. respectively in 1922. Compared with the pre-war

position, pig prices in 1923 were still about 60 per cent. above those of 1914.

Of the other items of farm produce, the most noticeable change in prices in 1923 occurred in *Potatoes*, the average price of which for the year as a whole fell to only 13 per cent. above pre-war level, as compared with 79 per cent. above in 1922. This decrease was, however, almost entirely accounted for by the slump in the first part of the year, when the heavy crop of 1922 was being disposed of, the price in some cases falling to 30 per cent. below the pre-war level. With the autumn, however, the 1923 crop realised much higher figures, the increase on the 1922 crop being in most cases 100 per cent., e.g. King Edwards, which fell in May to 82s. per ton, in December realised 160s. *Milk* remained comparatively dear at nearly 75 per cent. above the 1911-1913 level, the average price for the year as a whole working out to 1s. 3½d. per gallon, as compared with 1s. 3½d. in 1922. *Butter* showed little change at an average of £1 1s. 5d. per 12 lb. as compared with £1 1s. 9d. in 1922, prices being about 60 per cent. above pre-war. *Cheese* improved from an average of £5 5s. 6d. per cwt. in 1922 to £6 5s. in 1923, i.e. about 70 per cent above the 1911-1913 average. *Eggs* fell to 19s. 4d. per Great Hundred from the 22s. 2d. of 1922.

Although small *Fruit* was cheaper in 1923, other kinds were considerably dearer, pears rising from an average of 7s. 11d. per cwt. in 1922 to 29s., Victoria and Orleans plums from 11s. and 16s. per cwt., respectively, in 1922 to an average of 39s. 6d. in 1923, cherries from 53s. per cwt. to 74s. 6d., and dessert apples showing the smaller increase of 1s. 2d. per cwt. on the 13s. 4d. of 1922.

The Control price of *Hops* was increased from the £10 10s. per cwt. of the 1922 crop to £13 for 1923, a figure which was over 50 per cent. above pre-war value. *Wool*, at an average of 1s. 4½d. per lb., as compared with 1s. 1½d. in 1922, realised 44 per cent. above pre-war prices.

Hay, in the first part of 1923, realised good prices, but with the heavy new crop on the market, prices by the end of the year fell to pre-war level. First-quality Clover hay, which had fetched up to 168s. per ton in January, was available at 107s. in December, and Meadow hay, which had opened at 141s., fell to 91s. 6d. in the last month of the year.

IMPORTS.

Grain and Meal.

From Table VIII it will be seen that the imports of *Wheat* in 1923 increased by nearly 230,000 tons as compared with 1922, but were still 180,000 tons less than the average

for the three years 1911-1913; on the other hand the value of the imports fell by £5,000,000. The countries which supplied the greatest quantities were the United States of America 1,596,000 tons (a reduction of 267,000 tons on the previous year), Canada 1,424,000 tons (an increase of 279,000 tons), and Argentina 1,051,000 tons (an increase of 111,000 tons). Supplies from Australia were very short, only 233,000 tons being imported as against 817,000 tons in 1922, but this drop was compensated by the arrival of 626,000 tons from India, from which country the export of wheat had been prohibited up to the autumn of 1922. Some 586,000 tons of *Wheat-meal and Flour*, valued at £8,208,000, were also imported, as against 674,000 tons, of the value of £10,672,000, in 1922. Rather less than one-half of this quantity came from Canada and nearly one-third from the United States of America, although both these countries sent less than in 1922. On the other hand, imports from Australia, which formed the bulk of the remainder, showed a slight increase. Arrivals of *Barley* (907,000 tons), although somewhat lower than in 1911-1913, showed an increase of no less than 272,000 tons on the previous year, whilst the value of this commodity rose from £6,074,000 to £7,835,000. Of the total, U.S.A. supplied 311,000 tons against 296,000 tons in 1922, and Canada 150,000 tons against 127,000 tons in the preceding year. *Oats* were imported in slightly greater quantities, but only a little more than half the pre-war supply was needed. The increase over the previous year was mainly attributable to larger arrivals from the Argentine (168,000 tons, or 60,000 tons more than in 1922), Canada and U.S.A. contributing smaller quantities. In addition, some 43,000 tons of *Oatmeal* were shipped into the country. Imports of *Maize* fell slightly from 1,860,000 tons (valued at £15,022,000) to 1,727,000 tons (£14,269,000) and compared unfavourably with the average of the years 1911-1913 (2,194,000 tons). Canada and U.S.A. only contributed 310,000 tons as against 1,021,000 tons in 1922, but supplies from Argentina increased by 348,000 tons to 990,000 tons. *Maize-meal* was imported only to the extent of 76,000 tons, or two-and-a-half times the pre-war figure.

The total quantity of all kinds of grain and meal imported was 9,326,000 tons as compared with 8,972,000 tons in 1922.

Peas

Both *Beans* and *Peas* were imported in considerably larger quantities and on much the same scale as in pre-war days. *Peas*, of which 66,000 tons were imported in 1922, rose to 99,000 tons, the value increasing from £1,699,000 to £1,849,000. *Beans* showed an even greater percentage increase, the 1922 total of 39,000 tons, value £507,000, rising to 70,000 tons, value £678,000,

but it should be remembered that the figures for 1923 included Haricots.

Meat.

The total quantity of dead meat imported into the country was 1,560,000 tons, which is 240,000 tons more than in 1922 and 40 per cent. higher than in 1911-1913. *Beef* showed an increase from 588,000 tons to 693,000 tons with an increase of £2,500,000 in value, which was mainly due to the very large arrivals (84,000 tons) of chilled beef from Argentina and Uruguay, this amount being 28 per cent. greater than in 1922. Supplies of frozen beef increased 7 per cent., Argentina sending 136,000 tons as against 121,000 tons in 1922, whilst New Zealand and Uruguay also contributed a larger quota. Arrivals from Australia, however, decreased from 58,000 tons to 42,000 tons. *Mutton* showed comparatively little variation from the previous year either in quantity or value, heavier arrivals from Argentina and Australia compensating for the fall of 37,000 tons in the imports from New Zealand. *Bacon and Hams* were imported in much greater quantities; the main source of the supply of the latter is the U.S.A., whilst as regards bacon, Denmark contributed 177,000 tons (against 118,000 tons in 1922) and U.S.A. 141,000 tons (against 123,000 tons) towards the total of 390,000 tons. Some 31,000 tons of *Pork* were received, an increase of 8,000 tons over 1922; this increase is probably due to the inclusion in the returns of imports from the Irish Free State, since the arrivals of fresh pork from the Netherlands fell from 23,000 to 17,000 tons.

Live Cattle.

Some 16,500 head of live cattle were imported from U.S.A., as against 29,500 in 1922; the corresponding figures for Canada were 45,500 (including 27,500 shipped as stores) and 20,000.

Dairy Produce.

The quantity of *Butter* imported shows an increase of some 43,000 tons over the figure for 1922, but this is partly to be accounted for by the inclusion of supplies from the Irish Free State. Danish butter was imported in much larger quantities (93,000 tons against 71,000 tons), but Australia sent only 25,000 tons, or 20,000 tons less than in the preceding year; New Zealand contributed some 57,000 tons. *Cheese* arrived in somewhat larger quantities, and the figures for both butter and cheese are now well above the pre-war average. New Zealand and Canada between them sent over 80 per cent. of the total cheese supply, with 68,000 tons and 50,000 tons respectively; in each case this represents a rise of about 3,000 tons on the previous year. The arrivals of *Condensed Milk* were almost double the average

of the years 1911-1913, and showed an increase of 18,000 tons on the preceding year. The bulk of the supplies are of the sweetened variety, 72,000 tons of separated and 20,000 tons of whole milk being imported against 62,000 tons and 18,000 tons in 1922. In addition, 21,000 tons of unsweetened milk were imported; this represents an increase of 50 per cent. over the previous year, though it is still 10,000 tons below the total of 1921. Imports of *Eggs* rose from 14 to 20 million Great Hundreds. About one-half of this increase is due to the inclusion of imports from the Irish Free State, but Denmark, the Netherlands and France also sent increased numbers.

R. E. STANLEY.

42, Handford Road,
Brixton, S.W.9.

TABLE I.—Acreage under Crops and Grass and Number of Live Stock on the 4th June, 1923, and 3rd June, 1922, in England and Wales.

	England (excluding Monmouth)		Wales (including Monmouth)	
	1923	1922	1923	1922
Total Area (excluding water)	Acres 32,037,557		Acres 5,098,876	
Total Acreage under Crops and Grass (a)	23,128,176	23,204,600	2,815,085	2,821,193
Arable Land	10,451,425	10,545,921	729,712	766,594
Permanent Grass for Hay	3,767,044	3,825,923	588,809	587,195
" " not for Hay	8,069,507	8,834,758	1,496,474	1,467,404
Rough Grazings	8,317,204	3,242,866	1,564,623	1,538,610
Wheat	1,709,767	1,024,523	36,500	42,394
Barley	1,291,633	1,300,251	65,314	63,797
Oats	1,782,774	1,952,635	194,859	211,280
Mixed Corn	98,204	105,260	18,646	19,955
Rye	72,831	83,987	386	595
Beans (b)	233,647	283,346	1,346	1,562
Peas (b)	141,004	172,925	411	686
Potatoes	442,143	534,728	24,510	26,451
Turnips and Swedes	812,565	771,944	49,450	49,184
Mangolds	390,413	409,420	12,484	13,221
Cabbage for fodder, Kohl-Rabi and Rape)	128,944	127,049	11,028	9,727
Vetches or Tares	88,050	135,030	893	1,140
Lucerne	57,671	50,437	209	193
Hope	24,808	26,452	—	—
Small Fruit (c)	62,872	73,756	826	900
Orchards (c)	226,533	—	5,526	—
Clover, sainfoin, and Grasses under Rotation for Hay	1,624,559	1,325,727	190,468	201,919
" " " not for Hay	677,020	661,788	107,518	113,213
Other Crops	224,300	206,796	2,741	3,102
Bare Fallow	428,765	397,812	6,827	7,156
Horses used for Agriculture (d)	707,969	713,859	90,153	91,235
Stallions being used for service	4,543	4,879	1,217	1,195
Unbroken (One year and above	167,922	186,215	33,456	38,272
Horses (Under one year	51,627	65,429	14,596	15,461
Total	931,760	970,882	139,524	149,163
Other Horses	165,512	105,264	24,483	25,686
TOTAL OF HORSES	1,117,272	1,105,646	164,007	174,849
Cows and Heifers in Milk	1,706,821	1,669,093	268,225	264,893
Cows in Calf but not in Milk	259,138	254,172	29,883	34,462
Heifers in Calf	341,041	268,841	30,159	30,090
Bulls being used for service	60,074	69,851	11,875	12,696
Other Cattle:—Two years and above	854,587	757,487	82,938	82,929
" " One year and under two	927,402	976,058	180,788	190,102
" " Under one year	895,288	927,169	186,243	183,578
TOTAL OF CATTLE	5,032,851	4,923,021	790,141	799,640
Ewes kept for Breeding	3,901,609	3,941,801	1,513,736	1,496,845
Rams and Ram Lambs to be used for service	109,972	107,281	45,484	44,958
Other Sheep:—One year and above	1,769,741	1,550,236	599,467	587,419
" " Under one year	4,445,131	4,998,199	1,360,473	1,321,794
TOTAL OF SHEEP	10,816,263	9,997,504	3,519,180	3,440,516
Sows kept for breeding	353,040	272,627	85,605	39,419
Boars being used for service	94,640	21,190	1,584	1,631
Other Pigs	2,005,916	1,304,451	190,921	169,618
TOTAL OF PIGS	2,353,596	2,098,268	228,010	200,668

(a) Not including Rough Grazings.

(b) Excluding in 1923 areas grown for green fodder (4,696 acres in England and 175 acres in Wales).

(c) Including Small Fruit in Orchards; in 1923 the acreage under this heading in England amounted to 79,537 acres and in Wales to 228 acres. In 1922 the area of Orchards was shown against the crops, grass, or bare fallow beneath the trees.

(d) Including Mares kept for breeding.

TABLE II.—Total Produce, Acreage, and Yield per Acre of
1923 and 1922, with the Average

Crops	Total Produce		Acreage		Yield per Acre		Average of the Ten Years 1913-1922
	1923	1922	1923	1922	1923	1922	
WHEAT.							
	Tons	Tons	Acres	Acres	Cwt.	Cwt.	Cwt.
England (k) . . .	1,494,000	1,642,000	1,703,706	1,924,478	17-5	17-1	17-2
Wales (l)	23,000	32,000	36,500	42,890	15-0	14-0	15-1
Scotland (m) . . .	63,000	68,000	53,789	65,351	21-6	20-9	21-6
GREAT BRITAIN . . .	1,580,000	1,742,000	(d) 1,793,995	2,032,117	17-6	17-1	17-3
Ireland	(i)	28,000	38,871	40,864	(i)	18-6	19-2
UNITED KINGDOM	(i)	1,780,000	1,837,666	2,072,981	(i)	17-2	17-4
BARLEY							
(b)							
England (k) . . .	924,000	916,000	1,261,491	1,299,980	14-6	14-1	14-8
Wales (l)	41,000	40,000	65,309	63,772	12-6	12-6	13-6
Scotland (m) . . .	133,000	140,000	159,857	157,020	16-9	17-8	17-2
GREAT BRITAIN . . .	1,098,000	1,096,000	(e) 1,485,457	(e) 1,520,772	14-6	14-4	15-0
Ireland	(i)	154,000	153,741	170,233	(i)	18-0	18-1
UNITED KINGDOM	(i)	1,250,000	1,639,198	1,691,055	(i)	14-8	15-3
OATS.							
England (k) . . .	1,254,000	1,150,000	1,781,605	1,946,722	14-1	11-3	13-5
Wales (l)	99,000	102,000	194,697	210,420	10-2	9-8	11-5
Scotland (m) . . .	672,000	681,000	968,211	988,392	13-9	13-8	14-4
GREAT BRITAIN . . .	2,025,000	1,933,000	(f) 2,944,513	(f) 3,145,534	13-8	12-3	13-6
Ireland	(i)	880,000	1,175,671	1,213,692	(i)	14-5	16-5
UNITED KINGDOM	(i)	2,813,000	4,120,184	4,359,226	(i)	12-9	14-4
BEANS.							
England (k) . . .	188,000	187,000	222,296	270,664	17-0	13-8	15-5
Wales (l)	940	960	1,079	1,337	17-4	14-4	15-3
Scotland (m) . . .	3,000	3,000	3,803	3,992	16-2	18-6	19-6
GREAT BRITAIN . . .	191,940	190,960	(g) 227,180	(g) 275,713	16-9	13-9	15-6
Ireland	(i)	(i)	(i)	(i)	(i)	(i)	23-8†
UNITED KINGDOM	(i)	(i)	(i)	(i)	(i)	(i)	15-9†
PEAS.							
England (k) . . .	67,500	67,000	(h) 94,512	122,477	14-3	9-3	13-5
Wales (l)	80	120	(i) 160	240	10-5	10-0	11-7
Scotland	(i)	40	(i)	102	(i)	8-4	11-9
GREAT BRITAIN . . .	(i)	67,160	(i)	(i) 122,819	(i)	9-3	13-4
Ireland	(i)	(i)	(i)	(i)	(i)	(i)	16-4†
UNITED KINGDOM	(i)	(i)	(i)	(i)	(i)	(i)	13-7†

Particulars for Ireland have been furnished by the Department of Agriculture and Instruction for Ireland, and those for Scotland by the Board of Agriculture for Scotland. No Produce Statistics are collected for the Channel Islands and the Isle of Man.

(a) Peas are grown in any other part of the United Kingdom.

(b) Exclusive of a certain area (amounting in 1923 to 51 acres), the produce of which was 1,175,671 cwt.

(c) Exclusive of a certain area (amounting in 1922 to 147 acres) the produce of which was 1,213,692 cwt.

each of the Principal Crops in the United Kingdom (a) in
of the Ten Years 1913-1922.

Crops	Total Produce		Acreage		Yield per Acre		Average of the Ten Years 1913-1922
	1923	1922	1923	1922	1923	1922	
POTATOES.	Tons	Tons	Acres	Acres	Tons	Tons	Tons
England (k) . . .	2,842,000	3,387,000	442,143	534,728	6-0	7-2	6-3
Wales (l) . . .	116,000	175,000	24,510	20,451	4-7	6-6	5-5
Scotland (m) . . .	820,000	1,191,000	136,976	157,804	6-0	7-6	6-6
GRAT BRITAIN . . .	3,578,000	5,208,000	603,629	718,581	5-9	7-2	6-3
Ireland . . .	(i)	3,431,000	543,508	569,549	(i)	6-0	5-3
UNITED KINGDOM	(i)	8,634,000	1,152,137	1,288,130	(i)	6-7	5-8
TURNIPS AND SWEDES.							
England (k) . . .	10,226,000	10,321,000	808,783	770,502	12-6	13-4	12-3
Wales (l) . . .	653,000	577,000	49,450	49,194	13-2	11-7	14-2
Scotland (m) . . .	6,561,000	6,880,000	409,642	404,112	16-0	17-0	16-6
GRAT BRITAIN . . .	17,440,000	17,788,000	(h)1,287,855	(h)1,223,798	13-8	14-5	13-7
Ireland . . .	(i)	3,438,000	245,754	247,911	(i)	13-9	16-5
UNITED KINGDOM	(i)	21,226,000	1,513,609	1,471,709	(i)	14-4	14-2
MANGOLDS.							
England (k) . . .	6,743,000	8,350,000	388,974	408,187	17-3	20-6	19-0
Wales (l) . . .	201,000	210,000	12,484	13,221	16-1	15-9	17-7
Scotland (m) . . .	25,200	34,600	1,631	2,003	15-4	17-2	19-4
GRAT BRITAIN . . .	6,969,200	8,594,600	(h)403,089	(h)423,396	17-3	20-3	19-0
Ireland . . .	(i)	1,330,000	77,773	83,554	(i)	15-9	19-3
UNITED KINGDOM	(i)	9,924,600	480,862	506,950	(i)	19-6	19-0
HAY from CLOVER, SAINFOIN, &c.							
England (k) . . .	2,579,000	1,507,000	1,824,359	1,325,727	Cwt. 31-8	Cwt. 22-7	Cwt. 29-4
Wales (l) . . .	248,000	224,000	190,488	201,919	24-1	22-2	25-1
Scotland (m) . . .	657,000	679,000	414,527	431,001	31-7	31-5	30-8
GRAT BRITAIN . . .	3,484,000	2,410,000	2,229,354	1,959,247	31-3	24-6	28-6
Ireland . . .	(i)	(i)	(i)	(i)	(i)	(i)	36-5†
UNITED KINGDOM	(i)	(i)	(i)	(i)	(i)	(i)	32-3†
HAY from PERMANENT GRASS.							
England (k) . . .	4,284,000	3,534,000	3,767,044	3,825,923	22-7†	18-6	21-1
Wales (l) . . .	556,000	524,000	588,899	587,195	20-2	17-9	19-6
Scotland (m) . . .	238,000	223,000	152,857	144,804	30-5	30-9	30-6
GRAT BRITAIN . . .	5,113,000	4,281,000	4,509,700	4,557,922	22-7	18-8	21-2
Ireland . . .	(i)	(i)	(i)	(i)	(i)	(i)	41-6†
UNITED KINGDOM	(i)	(i)	(i)	(i)	(i)	(i)	27-1†
HOPS. (c)	Cwt.	Cwt.					
England . . .	229,000	301,000	24,893	26,452	9-2	11-4	10-4

(f) Exclusive of a certain area (amounting in 1923 to 1,831 acres) the produce of which was cut green.

(g) Exclusive of a certain area (amounting in 1923 to 11,616 acres of beans and 46,787 acres of peas) the produce of which was picked or cut green.

(h) Exclusive of a certain area (amounting in 1923 to 3,802 acres of turnips and swedes and 1,439 acres of mangolds) on which crops were grown for the production of seed.

(i) Figures not available. (k) Excluding Monmouth. (l) Including Monmouth.

(m) Figures for Scotland for 1923 are subject to slight revision. † Average of 5 years only.

‡ No separate figures available. The total area under Beans and Peas in Ireland in 1923 was 1,615 acres, as against 1,535 acres in 1922.

§ No separate figures available. The total area under Hay in Ireland in 1923 was 2,467,845 acres, as against 2,544,404 acres in 1922.

TABLE III.—Hops :—*Total Produce, Acreage, and Yield per Acre, in 1923 and 1922, in each County of England in which Hops were grown; and the Average Yield of the Ten Years 1913-1922.*

COUNTIES.	Total Produce		Acreage		Yield per Acre.		Average of the Ten Years 1913-1922
	1923	1922	1923	1922	1923	1922	
TOTAL FOR ENGLAND	Cwt. 229,000	Cwt. 301,000	Acres. 24,893	Acres. 28,452	Cwt. 9.2	Cwt. 11.4	Cwt. 10.4
Kent { East	37,000	40,000	3,585	4,085	10.5	11.2	11.2
Mid	58,000	72,000	5,304	5,528	10.7	13.1	12.2
Weald	60,000	85,000	6,719	7,113	8.9	12.4	10.7
Total Kent	153,000	206,000	15,458	16,736	9.9	12.3	11.3
Hampshire	7,000	11,000	1,018	1,073	7.5	10.3	8.7
Surrey	1,700	2,200	209	217	8.1	10.1	9.2
Sussex, East	18,000	32,500	2,159	2,271	8.2	14.3	10.1
West	400	950	77	83	5.9	11.4	10.4
Gloucester	100	85	11	10	8.7	8.5	—
Hereford	29,800	30,000	3,892	3,945	7.7	7.6	8.3
Salop	500	370	79	75	7.2	5.0	6.8
Worcester	18,000	17,700	1,951	2,032	9.3	8.7	8.8
Berkshire	—	40	12	11	6.9	3.5	—
Suffolk East	—	—	—	1	—	—	—

TABLE IV.—*Average Price of British Corn per cwt. (of 112 Imperial standard lbs.) in England and Wales, as ascertained under the Corn Returns Act, 1882, and the Corn Sales Act, 1921, in each Week of the Year 1923.*

Week Ended		Wheat	Barley	Oats
		s. d.	s. d.	s. d.
January	6	9 8	8 5	9 9
"	13	9 8	9 10	9 8
"	20	9 10	9 7	9 11
"	27	9 10	9 8	9 10
February	3	9 8	9 5	9 11
"	10	9 6	9 0	9 11
"	17	9 5	9 0	9 10
"	24	9 4	8 11	9 10
March	3	9 5	8 9	9 9
"	10	9 4	8 7	9 9
"	17	9 5	8 9	9 7
"	24	9 5	8 5	9 8
"	31	9 7	8 5	9 8
April	7	9 8	8 4	9 9
"	14	9 9	8 7	9 11
"	21	9 11	8 5	9 10
"	28	10 3	8 7	10 0
May	5	10 8	8 11	10 9
"	12	10 10	9 0	10 6
"	19	10 11	8 11	10 6
"	26	11 0	8 11	10 4
June	2	11 0	8 10	10 6
"	9	11 0	8 11	10 7
"	16	10 11	8 9	10 7
"	23	10 11	8 5	10 9
"	30	10 11	8 7	10 9

TABLE IV—continued.

Week Ended		Wheat	Barley	Oats
		s. d.	s. d.	s. d.
July	7	11 0	8 7	10 10
"	14	11 2	8 5	10 11
"	21	11 4	8 6	10 9
"	28	11 6	8 4	10 9
August	4	11 5	8 3	10 0
"	11	11 2	8 0	9 6
"	18	9 8	8 3	8 7
"	25	9 2	8 8	8 4
September	1	9 1	9 6	8 8
"	8	9 1	10 10	8 10
"	15	9 0	11 9	8 9
"	22	8 10	11 5	8 8
"	29	8 9	10 11	8 10
October	6	8 9	10 9	8 9
"	13	8 11	10 6	8 8
"	20	9 0	10 6	8 7
"	27	9 1	10 7	8 8
November	3	9 1	10 8	8 8
"	10	9 1	10 8	8 8
"	17	9 3	10 7	8 8
"	24	9 5	10 7	8 9
December	1	9 8	10 5	8 9
"	8	9 10	10 7	9 2
"	15	9 10	10 7	9 2
"	22	9 9	10 7	9 2
"	29	9 8	10 4	9 2
Average for Year		9-10	9-5	9-7

TABLE V.—Annual Average Prices per cwt. (of 112 Imperial standard lbs.) of British Wheat, Barley, and Oats, in England and Wales, in each year from 1914 to 1923, as ascertained under the Corn Returns Act, 1882, and the Corn Sales Act, 1921; with the Value of £100 of Tithe Rent-Charge, based on the Septennial Average Prices.

Year	Annual Average Prices per cwt.			Value of Tithe Rent-Charge of £100
	Wheat	Barley	Oats	
	s. d.	s. d.	s. d.	£ s. d.
1914 . . .	8 2	7 7	7 6	77 1 4½
1915 . . .	12 4	10 5	10 10	83 2 0½
1916 . . .	13 7	15 0	12 0	92 1 0½
1917 . . .	17 8	18 1	17 11	*109 3 11
1918 . . .	17 0	16 6	17 9	
1919 . . .	17 0	21 2	18 9	
1920 . . .	18 10	25 0	20 5	
1921 . . .	16 8	14 7	12 3	
1922 . . .	11 2	11 2	10 5	
1923 . . .	9 10	9 5	9 7	

* The Tithe Act, 1918, fixes the value of Tithe Rent-Charge, up to the year 1925 inclusive, at the sum payable in 1918, i.e. the value based on the septennial averages for the period ended 1917.

TABLE VI.—Monthly Average Prices of Fat Stock and Milking Cows in England and Wales during the Year 1923.

Description	Qual-ity	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
FAT CATTLE														
Per cwt. live weight														
Shorthorns	1	82	162	681	1062	1003	162	857	255	755	155	156	463	559 19
	2	65	356	655	558	056	756	651	149	348	647	848	954	753 9
Herefords	1	82	363	063	063	765	062	756	054	855	755	957	790	459 11
	2	55	756	1156	266	1158	457	350	349	849	1048	649	952	1053 5
Devons	1	59	359	1160	1161	1062	260	090	054	956	254	556	556	1158 19
	2	50	453	454	554	254	051	649	1047	847	1046	548	1050	050 8
Fat Cows	1	48	849	048	048	848	647	948	842	842	542	148	147	648 6
	2	42	841	741	341	940	839	436	936	035	1036	036	939	1039 0
Per stone dead weight														
Shorthorns	1	14	314	414	013	1114	214	013	212	1012	612	812	1113	713 4
	2	12	612	612	312	312	612	411	811	411	211	111	411	1011 11
Herefords	1	14	014	0	—	14	0	—	13	1012	1112	712	612	812 313 3
	2	12	6	—	—	—	—	—	11	1011	1011	611	311	1111 711 9
Devons	1	14	314	414	514	314	714	219	512	1112	1112	1012	1112	1112 9
	2	12	1012	1112	1113	012	112	1012	311	711	911	711	312	112 4
Fat Cows	1	10	1010	1010	610	510	710	710	910	810	810	710	810	210 2
	2	9	210	210	811	811	810	810	210	710	710	710	810	110 5
Per head														
MILKING COWS for Milk	1	40	1438	1436	035	134	533	1633	1934	1736	538	437	13	— 38 6
	2	32	530	1828	127	1626	1826	826	1126	1927	423	1823	12	— 38 6
Calvers	1	37	635	1432	1732	431	1431	832	432	233	1034	1938	12	— 38 6
	2	28	1627	1725	1225	825	026	325	825	1025	1527	1126	16	— 38 5
Per lb.														
VEAL CALVES	1	14	144	164	164	144	144	13	124	124	124	124	13	124
	2	114	124	124	124	124	124	11	104	104	104	104	104	114
FAT SHEEP: Down	1	164	184	184	184	184	16	154	154	154	154	16	164	164
	2	16	164	164	164	164	16	14	134	134	134	14	144	144
Longwools	1	17	174	174	174	174	164	144	144	144	144	144	154	154
	2	18	184	184	184	184	18	164	164	164	164	164	164	164
Crossbreds	1	18	184	184	184	184	18	164	164	164	164	164	164	164
	2	154	164	164	164	164	154	134	134	124	134	134	124	144
Per stone dead weight														
FAT PIGS: Bacon Pigs	1	14	314	613	112	812	712	311	611	811	1111	411	010	912 1
	2	12	412	511	1011	511	411	110	410	410	710	010	910	911 1
Porkers	1	12	412	511	1011	511	411	110	410	410	710	010	910	911 1
	2	12	412	511	1011	511	411	110	410	410	710	010	910	911 1

TABLE VII.—Yearly Average Prices of Fat Stock and Milking Cows in England and Wales during the Years 1914-1923.

Description	Quality	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
Per stone dead weight											
FAT CATTLE:		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Shorthorns . . .	1	9 211	9 13	8 17	9 10	8 18	4 21	9 19	10 14	9 13	6
	2	8 5 10	9 12	6 16	3 16	8 18	4 20	9 18	0 12	10 11	11
Hertsforda . . .	1	9 3 11	10 13	9 17	7 16	8 18	4 21	9 19	8 14	3 13	3
	2	8 8 10	8 12	7 16	3 16	8 18	4 21	11	—	12 10	11 9
Devons	1	9 2 11	11 13	7 17	6 16	8 18	4 21	10 20	4 15	0 13	9
	2	8 5 10	10 12	1 16	0 16	8 18	4 21	3 18	10 18	5 12	4
Per head											
MILKING COWS:		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Shorthorns:											
In milk . . .	1	23 13 26	6 34	5 46	3 53	15 52	11 61	6 54	13 39	3 36	6
	2	19 16 21	14 27	10 35	14 41	16 39	8 48	9 41	13 30	8 23	8
Calvers . . .	1	22 9 24	18 32	19 42	2 43	17 47	14 69	1 60	13 35	15 33	3
	2	18 19 20	15 26	13 33	15 38	19 36	8 45	7 40	5 29	12 26	6
Per lb.											
VEAL CALVES . . .	1	d. 9½	d. 10½	d. 12½	d. 16	d. 15½	d. 13½	d. 21	d. 18	d. 14½	d. 13½
	2	8½	9½	11	14½	13½	11½	18	15½	11½	11½
FAT SHEEP:											
Downs	1	0½	11	13½	16½	15½	17	23	19½	18½	16½
	2	8½	10	12	15	16½	17	21½	17	15½	14½
Longwools . . .	1	9½	10½	12½	16½	15½	17½	22½	18	16½	15½
	2	8½	9½	11½	14½	15½	17½	21½	16½	14½	13½
Crossbreds . . .	1	9½	11	13½	16½	16	17½	22½	19½	17½	16½
	2	8½	10	12	15	15½	17½	21½	17½	16½	14½
Per stone dead weight											
FAT PIGS:		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Bacon Pigs . . .	1	7 10	9 7 12	4 16	7 19	0 21	2 24	8 17	0 14	0 12	3
	2	7 4	9 0 11	7 15	9 19	0 21	2 23	8 15	5 12	7 11	0
Porkers	1	8 4 10	0 13	2 17	2 19	0 21	2 25	10 18	10 16	7 13	10
	2	7 11	9 6 12	6 16	6 19	0 21	2 24	2 17	4 14	8 12	8

TABLE VIII.—Quantities and Value of Imports of the principal Agricultural Commodities into the United Kingdom in 1922 and 1923, with the average for the years 1911 to 1913.

Commodities	Quantities			Value		
	Annual Average, 1911-13	1922	1923	Annual Average, 1911-13	1922	1923
<i>Grain and Meal.</i>	Tons	Tons	Tons	£	£	£
Wheat	5,225,307	4,818,982	5,046,481	43,068,074	58,794,183	53,797,688
Wheat Meal and Flour	538,713	673,738	585,923	5,714,439	10,671,730	8,207,564
Barley	1,118,516	635,164	907,194	8,071,609	6,073,516	7,834,982
Oats	912,288	407,845	488,133	5,800,459	4,363,001	4,144,935
Oatmeal (including Groats and Rolled Oats)	42,285	41,753	42,765	602,913	906,446	803,132
Peas	112,485	65,725	98,888	1,103,733	1,699,098	1,849,119
Beans (other than Haricot) . .	63,771	39,390	69,699	471,456	606,755	677,529
Maize	2,108,910	1,860,005	1,726,807	12,892,064	16,021,805	14,298,686
Maize Meal	29,099	109,493	76,284	218,885	931,365	688,287
<i>Meat.</i>						
Beef	443,953	587,705	693,007	15,964,027	29,411,917	32,084,311
Mutton	287,924	290,676	298,613	10,331,026	23,927,892	23,183,341
Pork (including Bacon and Hams)	317,011	406,160	531,659	19,781,848	47,652,278	51,439,136
Unenumerated (including Rabbits)	74,928	23,828	36,832	3,034,851	1,976,806	2,771,627
Total Dead Meat	1,103,816	1,322,359	1,559,661	49,112,752	101,968,891	109,493,211
Butter	207,448	218,428	258,265	24,679,478	37,315,536	44,248,737
Cheese	115,912	132,967	142,093	7,196,490	12,437,818	15,299,716
Milk, Condensed	80,498	94,493	112,944	2,141,134	5,687,564	6,244,345
Eggs	Gt. Hunds. 10,907,633	Gt. Hunds. 13,661,671	Gt. Hunds. 20,048,688	8,620,894	11,301,652	13,312,702

¹ Including Haricot Beans.

Note.—From April 1, 1923, the figures include the trade of Great Britain and Northern Ireland with the Irish Free State, and exclude the direct foreign trade of the Irish Free State.

NOTES, COMMUNICATIONS AND REVIEWS.

Reports of the Departmental Committee on Distribution and Prices of Agricultural Produce. This Committee, appointed by the Minister of Agriculture and Fisheries under the Baldwin administration in the last days of 1922, completed its inquiry within a year of its constitution, having presented four Interim Reports, each one dealing with a particular product, or group of products, and a Final Report.¹ Taken together, these Reports form a guide to the marketing methods adopted in this country in connection with the more important home-

¹ *Milk and Milk Products*, Cmd. 1854. *Fruit and Vegetables*, Cmd. 1892. *Meat, Poultry and Eggs*, Cmd. 1927. *Cereals, Flour and Bread*, Cmd. 1911. *Final Report*, Cmd. 2008.

grown foods, the authority and usefulness of which is beyond question. A study of agricultural marketing in this country has long been needed, and the Linlithgow Committee has made an important contribution to the subject. Possibly the greatest value of the Reports lies in their descriptive aspects. The reader gets the impression that when the Committee reached the stage of making definite criticisms of existing practices and conditions, and of framing recommendations for their amelioration, the necessity for compromise if unanimity were to be secured led to a good deal of watering-down of conclusions seemingly justified by the evidence. In no place is this more apparent than in the sections of the Final Report dealing with the question of agricultural co-operation. After discussing, at considerable length, the advantages which should accrue to the producer from co-operative organizations of various kinds, the Committee is unable to make any recommendation to the Government. The Reports will have permanent value as supplying the best study yet made of the marketing of farm produce.

Food Production in War. Thomas Hudson Middleton, K.B.E., C.B., LL.D. Pp. xx + 373. (Oxford: Clarendon Press.)

When the Division of Economics and History of the Carnegie Endowment for International Peace resolved upon the production of an Economic and Social History of the World War, the difficulty which confronted the collaborators was that any research into war history based upon official documents was rendered impossible owing to the fact that these, for the most part, had to be treated as secret. Accordingly they resolved to enlist the help of certain of those who had been actively engaged in the conduct of affairs in privileged positions during the war, and to trust to their narrative, supported by the available documentary evidence, for the production of a series of monographs. The plan had the advantage that economic history recorded in this way would not be limited to contemporary war-time studies, but would admit of a treatment of the various subjects over a larger period than that of the actual fighting. The period antecedent, as well as the after-war years, could be brought into review together with the time of national danger.

Following out this plan the British Editorial Board were fortunate in being able to secure the services of Sir Thomas Middleton for the compilation of the history of food production during the war. Successful alike as farmer, teacher and administrator before the war, he added to these qualifications for the work all the experience he had gained as Deputy Director-General of the Food Production Department. Only those who were brought into contact with the operations of this emergency

department of the Ministry of Agriculture can appreciate fully what this work involved. A nation which had decided deliberately that the interests of the majority demanded the sacrifice of agriculture to an ever-growing industrialism found itself brought suddenly face to face with the possibility of starvation. The excessive development of industrial resources, involving the exchange of home manufactures for foreign foodstuffs, was shown, almost in a moment, to be a policy only to be justified upon the assumption that the hundred years of peace which this country had enjoyed would continue into the Millennium. When this assumption was shattered, the ships upon which the nation had depended for a steady import of food were required for the purposes of war; the broad acres of England had largely reverted to grass; the men who remained on them had lost the art of tillage. A pre-war Royal Commission had suggested that ten weeks' reserves of bread-food was the bare minimum for national safety: at one period during the war the margin had fallen to about two-thirds of this minimum.

These were the conditions which the Food Production Department was called upon to face. Sir Thomas Middleton has given us a record of the measures taken to meet a situation which was to a large extent incalculable, by increasing the amount of home-grown food, and the record will have a permanent historical value. But it is much more than a carefully ordered account of the early differences amongst experts as to the need for an immediate break with the existing tradition of good farming; of the controversy between plough and pasture; of the decision forced upon the country by enemy submarine activity; of the steps which followed to bring back into tillage some of the millions of acres laid to grass in the days when the horizon of peace was unclouded; of the provision of men, machines, manures and money to speed up the process; of the results it achieved; and of their cost; all these matters will be read of by the student of the most poignant period of national history for many years to come. But Sir Thomas Middleton's book is far more than this, for it provides the fullest analysis of the national food-output; of its energy value; of the comparative value of foods; of the productivity of grass land and of arable land; and of many kindred matters which are of fundamental importance to the student of rural economy. Sir Thomas is clearly of the class which he himself describes as "plough-maniacs," though he recognizes very fully the great value of certain types of grass land, and it is impossible to read his pages and to digest the statistics they contain without being in full accord with him. Anyone who has stood upon a point of vantage in the Weald of Kent or Sussex, in Warwickshire, in High Leicestershire, or in many other places, and has looked

out upon a great sea of grass every acre of which is marked with high ridge and furrow, must have realized the great potentialities both of production and of employment which are looked up in them; and he must have questioned whether an economic policy which has made them no longer profitable under a more active system of husbandry, and which has reduced the agricultural worker class of the community by one-third of its number in little more than one generation, can be the best one for the nation. Sir Thomas is prepared to accept it as a pre-war policy, but rightly suggests that the difficulties created by the war would be lessened if arable farming could be rehabilitated. Discussing ways and means of doing this, he dismisses the possibility of a subsidy to the arable farmer, apparently because he has no faith in the stability of such a policy, and subsequent events have justified him; nor does he think that education or scientific research will much facilitate the process, for science can probably do more to help the grass farmer than the tillage farmer. Moreover, grass farming is safe and "a good education is no substitute for an insurance policy." The remedy favoured by the author is a discrimination in rating and taxation in favour of plough land, which might tilt the balance in favour of tillage. The burden of taxation upon land, he says, is very heavy, and, although it must be remembered that the relief now afforded under the Agricultural Rates Act, 1923, had not been provided at the time when his words were written, the statement may occasion some surprise. To-day in the normal rural district the local rates would rarely exceed two shillings per acre on agricultural land, and although the amount of income tax varies with the total income of the farmer it would hardly exceed one shilling per acre on the farm of 300 or 400 acres occupied by a married man with a young family. Some other means must be found if arable farming is even to be maintained, let alone increased, in this country.

C. S. O.

Foundations of Agricultural Economics. J. A. Venn, M.A.

Pp. xiv + 395. 12 illustrations. (Cambridge University Press, 1923. 16s.)

There is, unfortunately, considerable confusion in the mind of the average man on the subject of the economic foundations of the agricultural industry. Farmers are urged to greater output as the remedy for their present depression—the overwhelmingly large part played by foreign producers in the supply of foodstuffs is pointed to as something that can and should be remedied: in neither case, one suspects, have the advocates of such changes any clear conception of the fundamental economics of the industry.

Comparison of the subsistence-producing power of England and Wales, France and Germany reveals the striking fact that we maintain, by the combined efforts of industry and agriculture, a population equal in number to our total acreage of land surface, that in France the population is equal to one-third of the acreage, and that in Germany it is equal to two-thirds.

The actual figures are :—

	Population	Area	Proportion
Great Britain (1921) . . .	42,917,382	56,207,247	1 : 1·3
England and Wales . . .	37,886,242	37,137,564	1 : 1
Scotland	4,882,288	19,069,683	1 : 4
Germany (1919)	59,858,284	116,604,254	1 : 2
France (1921)	39,209,518	136,083,142	1 : 3·5

In other words, we are able to maintain three times the population in the case of France and one-and-a-half times the population in the case of Germany on an acre. Yet both these latter countries aim at and attain to a considerable measure of self-sufficiency in food supplies; and one claims to produce, in some commodities, a larger gross output per hundred acres than Great Britain.

This result is undoubtedly due to the fact that capital and labour can produce, when employed in industry, goods which, when ultimately exchanged in other countries for food products, will exchange for more of the latter than could have been obtained by the employment of that capital and labour in this country. This variation in the efficiency of capital and labour in industry and agriculture is due to the difference in result obtained by attempts to expand the one compared with the other. We cannot go far in increasing the output of agricultural land before we are confronted with the fact that further increased output can only be obtained at a greater cost per bushel or quarter. In manufacturing industry, on the other hand, the change is in the opposite direction, increased output generally brings lower unit costs. It is to the largely unfettered working out of these economic tendencies that we owe our ability to maintain such a large population.

The continuance of our power to do so depends upon the successful recovery and expansion of our manufacturing industries. With our present standard of agricultural knowledge increased home-grown food supplies can, in the vast majority of cases, be obtained only at an increased cost, which, supposing it to be reflected in market prices as a result of legislative protection, must react not only upon the standard of living of the working classes, but upon the capacity and power of British

manufacturers to compete in foreign markets. In the absence of such protection the remuneration for these increased costs would not be forthcoming, the prices of most of our primary agricultural products being determined largely by conditions in the chief food-producing countries of the New World, and, one might add, by the power of purchase enjoyed by other consuming countries.

It may indeed be desirable to attempt to counter purely economic forces on grounds of social or political expediency, and even from this aspect the problem has its special difficulties. The disproportion between our rural and urban populations, compared with the position in such countries as France, Germany or the United States of America, has its own reactions in practical politics. There are special difficulties in quickly re-establishing large numbers of men and women upon the land, not the least of which is the break in the tradition of small-farming, the result of the almost wholesale uprooting from the soil of the small farmer and labourer a century ago, and the high standard of living and comparatively short hours to be secured in urban occupations. The numerical weakness of the rural population, involving as it does political impotence, has not permitted the bringing of such pressure upon the Government as has been possible in countries with a more even balancing of rural and urban interests.

The above are a few of the economic and other factors which must be kept in mind in the consideration of the broad economic facts of the agricultural situation. The data upon which the details may be based are, fortunately, rapidly increasing in amount. The attention which has, in recent years, been directed to the collection and study of facts bearing upon the economics of the agricultural industry, more especially on the subject of Costs of Production, Marketing and Distribution, will, it is hoped, do much to make possible the more efficient organization of the industry.

Mr. Venn has produced a work which, for the purposes of the student of agricultural history, will form a most useful and readable addition to the available literature on the subject, much of the information only being obtainable elsewhere after laborious search in scattered volumes and the back numbers of agricultural journals. This volume contains chapters upon such subjects as modern land-tenure, the size of holdings, land tax, rates and income tax, British agriculture in peace and war, agricultural labour, markets and marketing, agricultural co-operation, the wheat supply of the United Kingdom, and other agricultural subjects. The treatment is on the whole historical, and brings down the story to the present day.

To the agricultural economist it will act as a valuable

historical introduction to the study of his subject; further, it is a volume that should be read by politicians of every party, among whom, with some notable exceptions, the knowledge of even comparatively recent agricultural events is at the best rudimentary.

The general accuracy of the work calls for mention—though the description of the “acre measuring two hundred and twenty yards by twenty-two yards” as “that universal agricultural unit” is misleading in so far as it implies a uniformity of area which cannot be said to have existed, in the popular use of the term “acre,” prior to the Act of 1824. In parts of the South-West and North-West especially the acre did not conform to the standard. Again, the Baltic can scarcely be described as the “market specially reserved for dealings in imported grain in London.” However, these details cannot be said to impair the all-round accuracy of Mr. Venn’s book.

G. D. A.

Farm Implements and Machinery. By J. R. Bond, M.Sc.
Pp. xvi + 282. (Benn Brothers, London.)

The development of agricultural machinery has, in recent years, been rapid, and undoubtedly one of the causes has been the war, when all manner of devices to save man-power had to be adopted. From those efforts many lessons were and have since been learnt.

The importance of encouraging the further development of farm implements is now officially recognized; a Committee has been set up by the Ministry of Agriculture to discuss the many difficulties that arise in the manufacture of implements to adequately carry out the work for which they are made. Further, a centre of research is being formed at one of the Universities to deal with the many problems in the development of farm implements.

In view of these facts no apology is needed for the appearance of a work on farm implements and machines. The author in his Preface does not claim the book to be an exhaustive work on farm engineering, but rather to assist farmers and students “who wish to understand the work and workings of farm implements and machines, how to select those likely to be most useful to him, and how to adjust, operate and care for them.”

As Sir John Russell points out in a Foreword to the book, many farmers are not mechanically minded and they have not the same feeling for a machine as for an animal. That farm implements are badly cared for and often wrongly used is rather the rule than the exception. Too often the use of oil and grease is forgotten and the life of many an implement could be lengthened by the use of these important substances.

The first chapter, of six pages, deals with tillage, and it would appear, in a book of this description, that if the question of tillage is to be dealt with, then a fuller discussion should be given. Unfortunately in a great many cases the reasons for the various operations embodied in the word tillage are little understood, not only by the student but also by the farmer. A more detailed account and explanation of the working of land for successful crop production would not have been out of place.

The next three chapters are devoted to the plough, in which the author fully describes the different types of ploughs, their use, the work they do, and the methods of setting and working. In the same way he exhaustively deals with cultivators, harrows, rollers, manure distributors, seed-sowing machines, potato planters, implements for after-cultivation, and harvesting machinery for hay, corn and potato crops.

In Chapter XIII a brief account is given of elementary mechanical principles. This is followed by a discussion of the work of the horse in which is shown the draught of vehicles and machines. In the same chapter, Chapter XIV, a comparison is made between the fuel efficiency of the horse and the engine; the cost of horse labour and the best methods of harnessing and hitching a team, a point too often neglected, are dealt with. A chapter is devoted to steam, petrol and paraffin engines, and two chapters to mechanical cultivation, tractors and tractor tillage. In dealing with the latter the questions of efficiency and cost are discussed.

The last three chapters deal with barn machinery, threshing machines and sheep-shearing machines. The book contains 273 illustrations, and a clear and detailed description of each implement and machine is given. The book will undoubtedly fulfil the object for which it is written and should prove of great practical value both to the farmer and the student.

W. R. P.

Equipment for the Farm and the Farmstead. By H. C. Ransömer. Pp. viii + 523. (Gunn & Co., London.)

In this book the author attempts to deal with the whole equipment of the farm. The first seventeen chapters may be said to deal with permanent equipment, and in these chapters a short description is given of materials for construction, fences, farm buildings, farm houses, laying out farms, lighting, water supply, pumps, power and sewage disposal.

Of necessity it is not possible in a limited space for these subjects to be thoroughly dealt with, but the author has embodied in the chapters many points that will be of practical use to the farmer. The chapters on materials and buildings

are well worthy of attention, for the author not only gives useful hints on making such temporary buildings as pig-houses, but also includes many useful working drawings.

The last eleven chapters are devoted to farm implements and machines, with a description of the making and use of ropes. Though these chapters have been written for farming under American conditions, much is applicable to this country.

The book is well illustrated with 543 photographs and diagrams.

W. R. P.

The Book of Alfalfa. F. D. Coburn. Pp. xi + 344. Illustrated. (Kegan Paul, Trench, Trubner & Co., Ltd. 18s.)

This book gives a popular account of the history, cultivation, merits and uses of alfalfa, or lucerne as it is more commonly called in this country, written by the Secretary of the Kansas Department of Agriculture in the United States.

The author "believes in alfalfa," as well he may, for it is a most valuable forage crop in his country, and he has written his book with true American vigour to bring the good features of the crop emphatically to the attention of his readers. The style is fluent, the meaning is always clear, and as a Britisher one appreciates the absence of clipped words so common now in American writings. The numerous illustrations are excellent.

The book is divided into twenty-six chapters, all of which are short except the last. Chapters, 4, 5, 6 and 7 will be found of most interest to British readers, since these concern the seed, cultivation and management of the crop and contain much valuable practical information. The author advises careful selection of seed, both as to vitality and also as to locality in which grown, recommending the use of seed from localities similar to that in which it is to be planted. Alfalfa, he says, can be grown on all soils except badly drained and sour soils, provided careful preparation of the seed-bed is practised. This preparation should commence a year or two before the seed is to be planted by deep ploughing and subsoiling for previous crops so that the alfalfa root can make a good start, and by the use of farmyard manure to previous crops, so that the land may be well supplied with humus. The immediate preparation should consist of a ploughing to moderate depth some months before the seed is to be planted and by frequent discing and harrowing at weekly intervals before the seed is sown so as to germinate and kill weed seeds. The writer rightly says that weeds are the worst enemies to alfalfa, especially if allowed to get up during the first few weeks of its life. Seeding the crop on bare land instead of planting it under a nurse crop is rightly

advocated, and farmers in this country would be well advised to follow the practice.

Another practice warmly advocated by the author and worthy of careful trial in this country is the discing (with the discs set straight forward) and harrowing of the field in the early spring of each year.

Chapters 9 to 17 discuss the use of alfalfa as a food to stock of various kinds and do not read so convincingly; much of the information is prefaced by some such form of words as "it is claimed by," going on to mention some may-be prominent farmer, but leaving the reader uncertain whether the author is prepared to back the statement. One such example occurs in the chapter on alfalfa for poultry: "If it is found that the eggs are larger when hens are given alfalfa it may be also found that the percentage of fertility (of the eggs) is greater"; but no evidence in support of either contention, that the eggs are larger or more fertile when poultry are fed on alfalfa, is given in the context.

This section also contains very short extracts from the results of a few numbers of feeding experiments which leave the impression that better value would have been given if a few only of these had been described in greater detail.

The last chapter contains ninety-four pages and quotes the opinion of some prominent agriculturist upon the value or prospects of alfalfa in each State of the Union; this is of no great interest to readers in this country.

Lastly, one must record two deficiencies; firstly, that scanty information is given about the use of mineral manures in the growth of alfalfa—a subject of very great practical importance; and secondly, the chapters on enemies of alfalfa is incomplete, since no reference is made either to crown gall or to the clover stem rot disease, both of which are present and sometimes troublesome on lucerne in both countries.

A. A.

The Society's Gold Medal for Agricultural Research.
—The regulations for the competition for the Society's Gold Medal for Agricultural Research have been reconsidered by the Council. It was decided to amend these by the omission of the age limit for competitors, and by ruling that a monograph or essay previously published should be ineligible. The regulations are now as follows:—

MEDAL FOR AGRICULTURAL RESEARCH.

1. The Medal shall be called the Royal Agricultural Society of England's Research Medal.
2. The Medal shall be awarded for a monograph or essay giving

evidence of original research on any agricultural subject or any of the cognate agricultural sciences.

3. Candidates for the Medal must reside in Great Britain or Ireland.

4. The Medal shall be adjudged by referees appointed by the Council of the Royal Agricultural Society. The referees shall have power to award, in the place of the Gold Medal, a Bronze Medal and books or money, together of equivalent value to the Gold Medal, if the successful candidate so desires.

5. The monograph or essay shall be forwarded to the Secretary of the Royal Agricultural Society on or before Michaelmas Day. The monograph or essay shall be typewritten or printed.

6. If in the opinion of the referees no monograph or essay be found to attain a sufficient standard of excellence, they shall be at liberty to reserve the Medal of that year for award as an additional Medal in some subsequent year.

7. The monograph or essay of the successful candidate shall be published in the Journal of the Royal Agricultural Society if, in the opinion of the Council, it is suitable for that purpose. Essays already published shall not be eligible.

8. The award of the Gold Medal will carry with it life membership of the Royal Agricultural Society.

THE NEWCASTLE SHOW, 1923.

The Show at Newcastle in 1908 was an outstanding one in many respects, but even more remarkable was the success of the great exhibition held in the City from Tuesday, July 3, to Saturday, July 7, 1923. Fifteen years ago Newcastle had been the place of meeting oftener than any other locality, and it now again leads other cities and towns in having entertained the premier agricultural Society no fewer than five times. The years of these shows with other information is printed in the table below, together with particulars of five other shows held in the North of England:—

Year.	Place of Meeting.	President.	Implements, etc. entered.	Entries of Live Stock.	Amount of Prizes.	Persons paying for Admission.	Financial Result (+ = Profit, — = Loss).
1846	Newcastle	1st Viscount Portman . .	735	613	1,391	No record	£ 2,133
1855	Carlisle	Mr. Wm. Miles, M.P. . .	1,314	808	2,175	37,533	— 860
1864	Newcastle	2nd Lord Feversham . .	4,024	1,099	3,195	114,683	+ 1,342
1880	Carlisle	9th Duke of Bedford . .	4,196	1,485	5,881	92,011	— 638
1887	Newcastle	2nd Lord Egerton of Tatton	3,616	1,825	6,780	127,372	+ 2,029
1895	Darlington	Sir J. H. Thorold, Bt. . .	5,856	1,703	5,863	100,310	+ 653
1902	Carlisle	H.R.H. Prince Christian . .	3,916	1,911	6,070	93,187	+ 2,898
1908	Newcastle	Duke of Devonshire . .	4,481	2,619	10,560	213,367	+ 10,054
1920	Doncaster	H.R.H. The Prince of Wales	4,809	3,468	11,700	182,892	— 7,766
	Doncaster	Lt.-Col. H. W. Stanbury	3,373	3,670	14,750	156,510	+ 19,102

* No Pigs Exhibited.

* Under a new arrangement certain exhibits are not now numbered.

In 1908, when the show was opened, no rain had fallen in the City for a week, and the spell of fine weather was only broken by one slight shower on the closing day of the meeting. Their Majesties the King and Queen (at that time Prince and Princess of Wales) honoured the show with their presence on two occasions. On their first visit, the Wednesday, the public attendance was 32,142, a record number for a half-crown day at that period. On the Friday, the day of the "official" Royal visit, 98,489 persons paid for admission, and this still ranks as the largest daily attendance recorded in connection with the Society's long series of shows, but the total of 213,867 for the five days in 1908 did not reach the aggregate attendance at the Manchester meeting of 1897. In that year the record number of 217,980 persons visited the show during the six days it was open.

Both the Northumberland and Durham Agricultural Societies gave up their own shows for the year 1923 and made contributions to the R.A.S.E. prize fund; in return, the members of the two County Societies were granted privileges in connection with the "Royal."

The showground on the Town Moor, placed at the disposal of the Society by the City Corporation and the Stewards and Freemen of Newcastle, was within a mile of the centre of the City, and electric cars, which ran by the Main Entrance in Park Terrace, provided a ready means of transport from the Central Station and other parts for visitors. On the north side was a second entrance to the yard direct from the show Garage for the convenience of Governors, Members and other visitors arriving by motor car. The site, 146 acres in extent, was the largest ever enclosed for the annual exhibition, and was bigger by about 40 acres than that which sufficed for the Society's requirements fifteen years ago. It had been prepared and levelled by the Local Committee and the various gas and water services installed. The fifth visit to Newcastle was marked by the erection of an entirely new Main Entrance pavilion with administrative offices. This structure replaced entrance buildings which first did duty on the same site for the show held in 1887.

Breed societies again made generous contributions to supplement the prize fund, as also did the Newcastle Local Committee and the two County agricultural societies who had abandoned their own annual shows. Including the value of challenge cups, medals and special awards, the total offered for competition was £14,750, or nearly a thousand pounds more than at Cambridge a year before when the prizes had reached a record sum.

The usual comparative statements of entries are given, together with a summary statement comparing the prizes, classes

and entries, breed for breed, with the previous Tyneside show. It will be seen that the Sheep section was the only one to have an increase of entries over 1922. Besides Cambridge, however, the only other year which had a higher aggregate entry of live stock of all descriptions was the Society's Jubilee in 1889, when the show took place in Windsor Great Park under Queen Victoria's presidency.

Live Stock as a whole again provided a most creditable representation of the British Breeds. Horses had an average entry. The Cattle classes throughout were of great merit, and as was to be expected at a north country show, Shorthorns were especially numerous and of pleasing quality. Dun and Belted Galloway cattle for the first time had a classification. Sheep provided an interesting display, particularly the breeds associated more intimately with Scotland and the Borders. The Pig classes were again well filled and keen competition resulted.

Entries of Live Stock, Poultry and Produce.

	Newcastle, 1903	Cambridge, 1922	Derby, 1921	Darlington, 1920	Cardiff, 1919	Manchester, 1918	Nottingham, 1916	Shrewsbury, 1914	Newcastle, 1908
Horses . . .	4641	4713	4601	4714	4669	4513	4500	4819	4664
Cattle . . .	11,185	11,647	11,254	11,175	10,667	10,003	10,062	11,272	10,465
Goats . . .	403	461	468	443	91	92	—	—	—
Sheep . . .	723	715	788	739	686	607	673	886	605
Pigs . . .	1,048	1164	902	692	389	321	360	417	312
Total . . .	3,670	4,200	3,613	3,463	2,502	2,341	2,297	3,394	2,619
Poultry . . .	1,189	1,205	1,219	1,476	1,383	1,519	1,286	1,373	768
Rabbits . . .	291	869	288	390	—	—	—	—	—
Produce . . .	436	247	322	475	287	665	461	895	416

¹ Exclusive of Double Entries.

Shedding in Implement Yard (in Feet).

Description of Shedding	Newcastle, 1923	Cambridge, 1922	Derby, 1921	Darlington, 1920	Cardiff, 1919	Manchester, 1918	Nottingham, 1916	Shrewsbury, 1914	Newcastle, 1908
Ordinary . . .	4,280	4,450	4,585	5,410	4,540	3,300	4,885	6,610	6,490
Machinery . . .	4,280	4,240	5,560	5,710	4,200	1,290	2,985	3,405	2,555
Special . . . (Goods, Models, etc.)	3,392	3,501	3,535	3,374	2,469	2,480	2,884	3,473	2,360
Total . . . (Exclusive of open space)	11,952	12,191	13,680	14,494	11,209	7,070	10,764	13,488	12,405
No. of Stands .	453	494	508	471	371	239	339	439	359

COMPARATIVE STATEMENT OF ENTRIES, &c.,
AT TWO SHOWS HELD AT NEWCASTLE-UPON-TYNE IN 1908 AND 1923.

HORSES, CATTLE AND GOATS.	1908		1923		SHEEP, PIGS, POULTRY, RABBITS AND PRODUCE.	1908		1923	
	Classes	Entries	Classes	Entries		Classes	Entries	Classes	Entries
HORSES :—					SHEEP :—				
Prizes . . .	—	£3,421	—	£4,397 5s.	Prizes . . .	—	£1,762 10s.	—	£2,154
Arabs . . .	9	70	12	74	Oxford Down . . .	4	45	5	53
Andalusians . . .	8	81	9	75	Shropshire . . .	7	124 ¹	6	44
Arabs . . .	5	29	9	43	Southdown . . .	6	64	6	47
Andalusians . . .	5	32	7	65	Hampshire Down . . .	5	31	5	34
Andalusians . . .	5	32	—	—	Suffolk . . .	6	24	6	69
Andalusians . . .	5	32	—	—	Dorset Horn . . .	4	21	—	—
Andalusians . . .	5	32	—	—	Dorset Down . . .	—	—	3	12
Andalusians . . .	5	32	—	—	Ryeland . . .	3	10	5	36
Andalusians . . .	5	32	—	—	Kerry Hill (Wales) . . .	4	13	4	13
Andalusians . . .	5	32	—	—	Lincoln . . .	7	53	6	42
Andalusians . . .	5	32	—	—	Leicester . . .	4	24	4	48
Andalusians . . .	5	32	—	—	Border Leicester . . .	3	76	4	61
Andalusians . . .	5	32	—	—	Half-bred . . .	—	—	3	11
Andalusians . . .	5	32	—	—	Wensleydale . . .	4	22	5	83
Andalusians . . .	5	32	—	—	Kent or Romney . . .	5	66	6	61
Andalusians . . .	5	32	—	—	Marsh . . .	4	21	4	15
Andalusians . . .	5	32	—	—	Cotswold . . .	2	7	—	—
Andalusians . . .	5	32	—	—	South Devon . . .	—	—	3	6
Andalusians . . .	5	32	—	—	Exmoor Horn . . .	—	—	—	—
Andalusians . . .	5	32	—	—	Look . . .	3	13	3	12
Andalusians . . .	5	32	—	—	Hardwick . . .	3	13	3	12
Andalusians . . .	5	32	—	—	Swaledale Dales- bred . . .	—	—	5	30
Andalusians . . .	5	32	—	—	Cheviot . . .	4	37	4	40
Andalusians . . .	5	32	—	—	Welsh Mountain . . .	2	10	2	8
Andalusians . . .	5	32	—	—	Black Welsh Moun- tain . . .	—	—	2	7
Andalusians . . .	5	32	—	—	Blackfaced Moun- tain . . .	5	62	4	46
Andalusians . . .	5	32	—	—	Total for SHEEP . . .	85	734 ¹	95	723
Andalusians . . .	5	32	—	—	PIGS :—				
Andalusians . . .	5	32	—	—	Prizes . . .	—	£770 5s.	—	£1,697
Andalusians . . .	5	32	—	—	Large White . . .	6	83	8	158
Andalusians . . .	5	32	—	—	Middle White . . .	6	35	8	190
Andalusians . . .	5	32	—	—	Tamworth . . .	6	28	6	17
Andalusians . . .	5	32	—	—	Berkshire . . .	6	61	8	111
Andalusians . . .	5	32	—	—	Large Black . . .	6	64	8	262
Andalusians . . .	5	32	—	—	Gloucestershire Old Spots . . .	—	—	8	124
Andalusians . . .	5	32	—	—	Lincolnshire, Curly Coated . . .	6	41	5	29
Andalusians . . .	5	32	—	—	Cumberland . . .	—	—	5	50
Andalusians . . .	5	32	—	—	Wessex Saddleback . . .	—	—	6	52
Andalusians . . .	5	32	—	—	Essex . . .	—	—	6	55
Andalusians . . .	5	32	—	—	Total for PIGS . . .	36	312	68	1,048
Andalusians . . .	5	32	—	—	POULTRY :—				
Andalusians . . .	5	32	—	—	Prizes . . .	—	£199 5s.	—	£436 3s. 6d.
Andalusians . . .	5	32	—	—	Entries . . .	99	768	143	1,189
Andalusians . . .	5	32	—	—	RABBITS :—				
Andalusians . . .	5	32	—	—	Prizes . . .	—	—	—	£108
Andalusians . . .	5	32	—	—	Entries . . .	—	—	42	291
Andalusians . . .	5	32	—	—	PRODUCE :—				
Andalusians . . .	5	32	—	—	Prizes . . .	—	£249 15s.	—	£246
Andalusians . . .	5	32	—	—	Butter . . .	2	79	6	108
Andalusians . . .	5	32	—	—	Cheese . . .	9	95	13	220
Andalusians . . .	5	32	—	—	Cider . . .	4	43	3	38
Andalusians . . .	5	32	—	—	Wool . . .	10	76	15	70
Andalusians . . .	5	32	—	—	Hives and Honey . . .	24	123	—	—
Andalusians . . .	5	32	—	—	Total for PRODUCE . . .	49	416	37	436

Grand Totals for
STOCK, POULTRY,
PRODUCE, &c.

1908 . . .	470 Classes	4,099 Entries	£10,560 * Prizes
1923 . . .	639 Classes	8,001 Entries	£14,750 * Prizes

Animals exhibited in more than one class are here counted as separate entries.
 * Including £280 for Farm Prizes, £281 for Local classes, £250 for Horticulture, and £567 for Competitions.
 * Including £300 for Horticulture and £60 for Local Classes.

When the gates were opened on the morning of July 3, the weather was dull but fine, and the judging, the principal business of the day, was carried through under pleasant conditions. Besides the stock, implements, forestry and educational sections, there were also to be seen the exhibits in the Horticultural department, which, on this occasion, despite the handicap of an unfavourable season, maintained the high standard set in previous years. The Horticultural Exhibition remained open until the evening of the Friday, and daily attracted large numbers of visitors. The charge for admission to the showyard was ten shillings, and the day's attendance was 3,587.

On the second day all departments of the show were open to visitors. Judging of the Poultry exhibits took place during the morning, and as soon as the awards had been made the public were admitted to this section. The National Championship Dog Show was also opened and continued on the following day. It proved a great attraction and source of interest to the sport-loving people of the North.

H.R.H. The Prince of Wales, who was the guest of His Grace the Duke of Northumberland, had journeyed from London and arrived at Alnwick Castle on Tuesday evening. On the following morning His Royal Highness, with His Grace and other members of the House party, came by motor car direct from Alnwick to the show, arriving at the Main Entrance at 11.45. The Prince was met by the Honorary Director, Sir Gilbert Greenall, who conducted him through the Implement Yard to the Royal Pavilion, where the President, Colonel Stanforth, and other members of the Council, received the Royal visitor. It had been arranged that Newcastle's official reception of His Royal Highness should take place inside the show-ground, and the scene of this ceremony was the enclosed space in front of the Royal Pavilion. The Lord Mayor of Newcastle, supported by a distinguished gathering of local representatives, welcomed His Royal Highness, and an Address was presented on behalf of the Corporation. The Prince's reply was as under:—

"During the past few months I have visited a number of our great cities, both in Yorkshire and in the Midlands. I am indeed glad that it has been possible for me to add to the list of such visits the few days on Tyneside, where I expect to get to-morrow a further insight into the daily life of a modern industrial centre. As I have spent a good deal of my life at sea there is much to be seen at Newcastle which is of particular interest to me. It is, for instance, the cradle of marine engineering, responsible, among other notable mechanical creations, for the invention and development of the steam turbine, which has practically revolutionized ship propulsion all over the world. Furthermore, on the Tyne are built and launched year after

year a great many of our British ships. Shipbuilding and engineering are industries vital to our national prosperity. You who practise and develop them here in Newcastle have good reason to be proud of your work—a daily contribution to the welfare of the Empire as a whole. Nor do you neglect the higher learning without which such industries cannot live. By the support which you have given to Newcastle Division of the University of Durham, to your two great colleges, the Armstrong College and the College of Medicine, you have shown that you rightly reckon these institutions among your necessities. I trust that they may always have in the future an equal measure of your encouragement, with even greater opportunities of public service than those which they have already put to such wise and profitable use.

"But the immediate object of my coming here to-day is the Royal Agricultural Society's Show. It is a tribute to Newcastle that the Society should once more have chosen it as the scene of what is in every way a national gathering. I sincerely hope that this choice may prove a benefit to the city and the county alike. To this hope I must add, my Lord Mayor, a heartfelt expression of my thanks for the cordial and hospitable welcome by which you and all your fellow-citizens have marked my first visit to Northumberland."

His Royal Highness then proceeded to the Large Tent to attend the General Meeting of Governors and Members of the Royal Agricultural Society. A most hearty resolution of welcome was passed on the motion of the President; for which the Prince expressed his thanks. The proceedings also included resolutions of thanks to the Lord Mayor and Corporation of Newcastle and to the Local Committee for their cordial reception of the Society and their exertions to ensure the success of the show. On behalf of the County of Durham, Mr. Alderman Davis and Mr. William Parlour presented to the Society "The Brothers Colling Shorthorn Memorial Challenge Cup."

This Cup, illustrating the story of the world-famous achievement of these two brothers, has been inspired by the early English Founders' Cups, in which symbolism is bent to the purpose of design. Beginning at the foot of the Cup, one sees the land, furrow, rig and root, from which rise trunk and branch, encircling a golden bowl representing a cornfield in stook. At this point the Brothers Colling step in and take up their positions as flanking ornaments, forming the handles. The eye is immediately led up to the Collings' crowning achievement, viz. the Bull "Comet," itself a vital piece of animal sculpture. It is interesting to note that this trophy is presented to the Royal Agricultural Society of England by the Durham County Agricultural Committee, and will be competed for annually at

the Society's shows for the best beast in the Shorthorn Classes. The Cup, being a Memorial one, is a perpetual trophy, and it will not be possible to be won outright. The winner each year will have the right to have his name inscribed on one of the shields provided on the plinth.

While His Royal Highness was speaking at the meeting, there was a sharp shower of rain, but conditions soon improved.

After luncheon, H.R.H. The Prince of Wales, with the President of the Society, made a tour of the showground, visiting both stock and implement sections. At the stand of the Ministry of Pensions Hospital, Castle Leazes, a halt was made. Here the Prince shook hands with a number of men in hospital blue, and inspected specimens of their work. His Royal Highness later went on to the Large Ring, and from the Royal Box in the Grand Stand watched the jumping competitions.

During the early hours of Wednesday morning the large straw stack in the fodder yard was found to be on fire. The showyard fire brigade were at once summoned, and, with the assistance of the Newcastle City brigade, succeeded in preventing the spread of the conflagration. The stack was however completely ruined, but so good were the arrangements that a reserve supply of straw was immediately secured, and exhibitors' requirements were speedily satisfied.

Thursday was gloriously fine, and attracted the largest attendance (63,183) of the week. Milkers' competitions and judging of the Dairy Cows entered for prizes offered by the Northumberland and Durham Agricultural Societies took place, and an exhibition of Rabbits was opened.

Splendid weather continued on the Friday, with a high temperature; it was, in fact, the beginning of the heat wave experienced in the month of July. His Royal Highness, after fulfilling engagements in the City, again attended the show, but the visit was of an informal character. Amongst other things, the Prince witnessed a parade of prize-winning horses and cattle in the large ring, and His Royal Highness took the opportunity to send for and congratulate Mr. A. J. Marshall, the owner of "Bridgebank Paymaster," on having been the first winner of the Brothers Colling Shorthorn Memorial Challenge Cup.

On the closing day, Saturday, some ten thousand children from the schools on Tyneside came to the show between the hours of 9 and 10.30, a reduced charge having been arranged between the Society and the local Education authorities. In the gate returns four children were reckoned as one adult.

A feature of special local interest was the Tyneside Horse Parade which took place in the Large Ring under the auspices of the Northumberland and North Durham Society for the Pro-

tection of Animals. This included all kinds of Horse-drawn Trade Vehicles and Pit Ponies. The animals were judged on the Town Moor and entered the Ring to receive the awards. Great credit is due to the local exhibitors for the care and attention bestowed upon their charges.

Rain began to fall about 6 p.m., which, with the exception of the shower mid-day on Wednesday, was the only wet weather experienced during the show.

Tables giving the attendances this year at various hours on the several days and comparative figures for other shows are appended.

Admissions by Payment at Newcastle, 1923.

Day of Show.	11 a.m.	1 p.m.	3 p.m.	5 p.m.	Day's total.
Tuesday (10s.) . . .	1,831	3,015	3,431	3,573	3,587
Wednesday (6s.) . . .	18,439	28,184	35,444	37,763	37,926
Thursday (3s.) . . .	20,995	42,062	58,488	62,415	63,183
Friday (3s.) . . .	14,496	26,337	38,920	41,686	42,457
Saturday (2s.) . . .	14,623	24,291	35,692	39,192	39,357
					186,510

Total Admissions at Newcastle in 1923, compared with previous six Shows and Newcastle, 1908.

Day of Show	New-castle, 1923	Cam-bridge, 1922	Derby, 1921	Dar-lington, 1920	Car-diff, 1919	Man-chester, 1918	Notting-ham, 1915	New-castle, 1908
First . . .	3,587	8,338	3,701	11,897	8,466	4,067	1,641	2,397
Second . . .	37,926	21,880	33,979	51,479	46,096	29,145	12,321	32,142
Third . . .	63,183	31,903	33,931	52,626	68,838	39,938	30,798	28,890
Fourth . . .	42,457	21,408	31,777	40,389	36,292	40,874	26,034	96,489
Fifth . . .	39,357	18,823	22,350	27,001	35,002	38,173	33,089	51,959
	186,510	92,352	125,823	182,892	191,604	149,197	108,883	213,897

Competitions for shoeing smiths, which were an interesting feature of the recent exhibition, were first held by the Society at the Newcastle show of 1887. The Competitions this year were organized and conducted by the National Master Farriers' Association. The entries numbered 91, and the chief award was the Championship of Great Britain. A collection of non-slipping horse-shoes in the showyard shoeing forge attracted considerable attention and large audiences listened to the interesting lectures

248 *Miscellaneous Implements Exhibited at Newcastle Show.*

given during the week on "The Structure of the Horse's Foot and the Principles of Shoeing."

The arrangements for the transport of animals and implements to and from the show were, as is usually the case, quite satisfactory.

A record has been created in the annals of the Society, the surplus of Receipts over Expenditure on the Show Account reaching the high figure of £19,101 11s. 2d., a sum not likely to be reached or exceeded for many years to come.

Much of the success of the show was due to the work of the local officials, Mr. A. M. Oliver, the Town Clerk, as Local Hon. Secretary, Mr. J. J. Gillespie as Joint Hon. Treasurer of the Local Fund, and Mr. J. D. Walker as Chairman of the Stewards and Freeman, working untiringly in all matters affecting the welfare of the Society on its visit to Newcastle. The Hon. Director, a "persona grata," with all the Newcastle officials who remembered his work at the 1908 show, negotiated all the difficulties which arose from time to time on behalf of the Society in a manner satisfactory to all, and much regret was expressed at the news of his impending retirement after the Chester Show in 1925.

The Staff also ably assisted in the preparatory work and during the Show, and are deserving of the thanks of the Society.

T. B. TURNER.

16 Bedford Square,
London, W.C.1.

MISCELLANEOUS IMPLEMENTS EXHIBITED AT THE NEWCASTLE SHOW, 1923.

THE new implements entered for the Society's Silver Medals at Newcastle numbered 50, which was a drop as compared with the entries of 82, 64, and 73 at the three previous shows, but on a par with the pre-war figures of 52 in 1914. Of the 50 entries five withdrew, and from the 45 implements adjudicated upon the judges selected three as worthy of a silver medal. At the same time, there were several exhibits worthy of commendation even if they failed to comply entirely with the regulations governing these awards or hardly reached the high standard which it is right should be maintained if the prestige of the medals is to be upheld.

The implements gaining the medals were fully up to the standard of previous awards, being sound, workmanlike constructions,

and throughout the unsuccessful exhibits there was evidence of improvement in design and construction, and commendable progress in many branches of Agricultural Engineering.

Following the catalogue order for convenience, Stand 137.



FIG. 1.—Threshing Machine with Stack Feeder.

No. 606, the *Threshing Machine with Stack Feeder*, as exhibited by Wm. Foster & Co., Ltd., of Lincoln, gained the first Silver Medal, with what may be described as an entirely new invention, and not merely an improvement on previous ideas. The Stack

Feeder consists of a feeding-trough, up which passes a feeding-belt or conveyor, fitted with transverse rows of teeth like a saw-edge, for the purpose of carrying forward the sheaves. This feeding trough can be raised or lowered by means of a balancing arm pivoted on the top of the threshing machine with balance weights at its other end, so as to convey the sheaves from the top of the stack down to the threshing drum or from the bottom of the stack upwards, as the case may be.

As the sheaves approach the top of the trough they pass under two knife-edged circular discs which cut the twine, and the loosened sheaf then passes under a combing drum, the transverse teeth of which feed the straw forward into the drum by rapidly combing off the top portion of the sheaf. The combing drum, of course, runs at a much greater speed than the belt conveyor, and thus quickly combs away or feeds in the sheaf before it has finally passed over the conveyor. This gives a regular even feed on to the drum, and that irritating bumping of a carelessly fed hand threshing machine was conspicuously absent during the trial. If the sheaves are fed in too fast for the proper threshing speed or capacity of the drum, a further automatic stop or rejector comes into action, by which the speed of the belt conveyor is reduced, and almost, if not quite, entirely stopped, whilst the combing drum rapidly combs away the sheaf until a normal state of affairs is regained, when the conveyor belt again functions at its proper speed; the whole, however, stopping if a stone or shoe enters the machine. The advantages of the invention, which worked admirably under trial, would appear to be:—

(i.) A reduction of the pitchers or men forking on the stack by probably 50 per cent., as the trough lessens the distance the sheaves have to be forked, and makes the work much less arduous, as practically no sheaves have to be raised more than 2 ft.

(ii.) Two, if not three, hands are dispensed with on top of the machine; i.e., the feeder and one or two band-cutters, as the case may be.

(iii.) The feeding being automatically even and regular, there is no bumping or jarring of the threshing drum, and the life of the machine is therefore greatly increased.

(iv.) The drum is fed more quickly than by hand, as over 30 sheaves per minute were threshed, as compared with 20 by hand—a gain of 50 per cent.

It may be thought that the addition of the trough, feeding box, and protecting arm on to the top of the already big and cumbersome threshing machine would be an objection, but it was proved that two men could open out or pack up the stack feeder within 4 minutes, and when packed the feeder increases the total height of the machine by inches only.

Altogether the judges were much impressed by the construction of this new invention and its success when tried on a farm near the Showyard, and had no hesitation in awarding it a medal, the cost being £95 less 10 per cent. for cash at the makers' works.

Many a farmer who has been bothered with the starting of his oil engine, which is usually effected by a starting or blow lamp, or the use of petrol and magneto ignition, will welcome the advent of *Petters' Patent Cold Starter*, as shown by Petters Ltd., of Yeovil, being exhibit No. 660, Stand 142, and which was awarded the second of the medals.

By this simple invention a crude oil engine is almost placed on a par with a petrol engine so far as ease in starting is

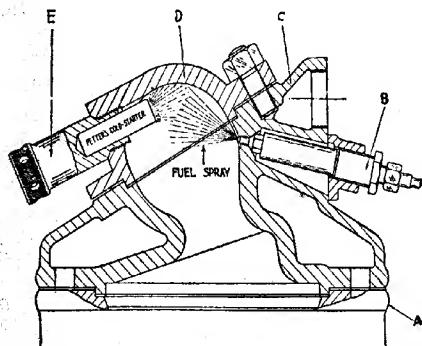


FIG. 2.—Petters' Patent Cold Starter.

A. Cylinder.—B. Sprayer Body.—C. Cylinder Head.
D. Vaporiser.—E. Cold Starter Holder.

concerned, the procedure being that a combustible cartridge is fitted into a metal plug or holder constructed of material which quickly attains a high enough temperature under the joint heating action of the burning cartridge and the preliminary explosions to maintain ignition until the normal running temperature of the vaporiser or hot bulb is attained.

This metal plug or cartridge holder is best made of an alloy which does not scale at high temperatures, and it screws by a coarse thread into the hot bulb or vaporiser.

The combustible cartridge having been lit (it burns somewhat like a fusee), the holder is screwed into the vaporiser, the opening being just opposite to the fuel injection nozzle of the engine; the cartridge then burns away entirely, and in doing so generates sufficient heat to ignite the preliminary charges when the engine

is started in the usual way, and also heats the metal tube or holder to such an extent that when the cartridge is burnt out the tube is hot enough to maintain the explosions in the engine.

When tried the device acted admirably, and a turn or two of the flywheel set the engine going immediately; this must prove a boon to users of crude oil engines, or, more correctly speaking, internal combustion engines of the Semi-Diesel, Hot Bulb, or Surface Ignition type.

It only remains to add that the cartridges are inexpensive, costing about three farthings each; that they are non-poisonous, and, with any reasonable care, safe in transport and for storage, and that they can be fitted for engines up to 24 h.p.

The last of the medals was given to Messrs. John Wilder (Reading), and R. J. & H. Wilder (Wallingford), Stand 298,

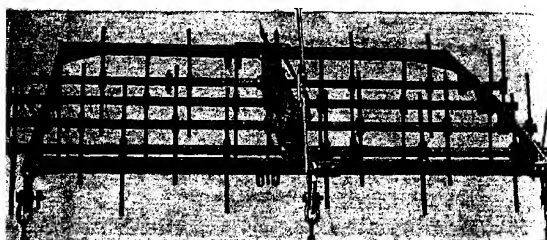


FIG. 3.—Self-Cleaning Pitch Pole Harrow.

No. 2582, for their *Self-Cleaning Pitch Pole Harrow*, which has been very materially improved since it was exhibited at Cambridge last year, and from its performance, when tried outside the Showyard, would seem to provide a Self-cleaning Tractor Harrow which can be operated from the tractor driver's seat by the usual cord attachment, so that the harrow can be cleaned, put into operation again, or put out of gear so as to travel free at the ends of the field without the driver having to leave the tractor seat. The harrow consists of double-pointed tines are carried on the four cross-bars of a strongly built square frame, the depth at which the harrow is being controlled by the set or angle of the tines. When it is necessary to clear the harrow of dirt, weeds, &c., this is effected by a moderate pull on the controlling cord, which actuates a lever on the centre of the harrow and causes the first and

third rows of tines to tip or turn over, releasing the dirt encumbering them, just as they are coming into working position, having completed a half-circle turn; the second and fourth rows are automatically tipped in the same way, and the whole harrow thus cleaned.

A harder pull on the control cord causes the whole of the tines to tip or turn simultaneously, this being necessary so as to turn the harrow round at the end of the field, *i.e.*, allow it, so to speak, to walk or "freewheel," and a further pull then brings it back into full work again. The three operations of cleaning, turning, and resuming work are thus all effected by pulling the controlling cord, but they are absolutely distinct and controllable by an ingenious arrangement on the central controlling bar.

The tipping is effected by special "tipping tines," two on the first row of tines and one on each succeeding row; and the working angle of the tines is controlled by a vernier fitting on the centre bar which is quickly adjustable.

There is a handy transport arrangement, the harrow, when loaded, being 7 ft. in width, and in work 8 ft. 3 in., and if fitted with 25 tines they each have a 4-in. track. The price, including delivery and starting, is £33, and it is now available as a horse implement in a modified form.

Amongst the Implements which were not awarded a medal were the following:—

Stand 92, No. 172. Tractor Subsoiler, exhibited by Cellier's Motors Ltd., Brighton Road, Coulsdon, Surrey, a strongly constructed machine in which the subsoiler is actually attached to the tractor. This, it is claimed, gives a lighter pull on the engine and obviates side-draught, whilst the weight of the tractor keeps the tine up to its work, and the plough itself is not so heavily strained.

The depth ploughed and subsoiled is 18 in., the subsoiler working in the last furrow.

The fitting is attached to the tractor by a split collar and two torque rods on the ploughing side, and on the land side it is clamped on to the axle by a strap fitting; at the back a notched quadrant governs the depth, each notch representing 1 in. in depth.

The draw-bar pull, when ploughing and subsoiling, is about 1,000 lbs., subsoiling only 450 lbs.; and the cost per acre for single-furrow ploughing and subsoiling 37s. 6d.

With a two-furrow plough, the alternate furrows would be subsoiled, and then by crossing the land would be thoroughly cultivated.

Stand 123, No. 417. The "Multipotent" Coulter, shown by S. C. Darby, Stileman's Works, Wickford, Essex, is designed to attach to any corn-drill in lieu of the existing coulter and to meet

the demand which has sprung up recently for the shallow sowing of corn. This compound coulter, so to speak, consists of, first, a disc coulter; second, a wide seed coulter, behind which the seed falls; this is followed by coverers somewhat like horse-hoe blades; and finally, a wide, flat wooden roller, all fittings being adjustable.

It was claimed that a drill so fitted is not heavier for horses, and saves harrowing afterwards; also that as an 11-in. space between the coulters is sufficient, seed is saved thereby.

On Stand 125, Messrs. J. H. Peck & Co., Ltd., Tarpaulin Works, 66 Wallgate, Wigan, Lancs, showed a special fireproof Waterproof Threshing Tackle, or Motor Haulage Cover, which by a chemical treatment had been made practically sparkproof and fireproof, and certainly would withstand a great degree of heat, if not entirely incombustible, so nearly so, at all events, that many stackyard or other fires would be delayed and probably entirely prevented, the cost being only 6d. per sq. yd. more than the ordinary waterproof sheet.

Stand 131, No. 496. J. C. & T. Yates, Market Place, Doncaster, exhibited a Turnip and Mangold Drill with side-hoes for rows removable for drilling, the rollers being removable for hoeing. The hoes are adjustable to any angle, the machine being thus a double-purpose implement.

Stand 134, No. 524. Martin's Cultivator Company, Ltd., Lincolnshire Iron Works, Stamford, showed their Silver Medal Swath Turner of 1922, with improvements, in that it was claimed the front action was an improvement on the zigzag action of last year in giving a better clearance, the machine is lighter, and the frame balanced for foot-working. The tines have now a backward motion as well as sidelong, giving less risk of breakage and more flexibility. These tines are undoubtedly a great improvement on the round spiral spring type, being more durable.

On the same stand, No. 525, was a new Rotary Pump for fire engine or estate use. The idea, though perhaps hardly absolutely new, is most simple and ingenious, the eccentric movement of a small circle within a larger circle giving the pumping effect, it being claimed that a higher pumping efficiency was effected in this pump as compared with previous designs; the cost of a pump to raise 350 galls. per minute to a head of 200 ft. with 80 lbs. pressure being £100.

Petters Ltd., of Yeovil, Stand 142, No. 661, brought out a Scotch-made threshing machine combined with a Grinding Mill, in which the mill plates are fitted directly on to the medium-speed drum-shaft. The drum acts as a flywheel to the mill, and both grinding and threshing are done simultaneously, the corn from the thresher being fed automatically on to the grinding mill, which can, however, be used separately. With an 8 h.p. engine or motor 35 bushels an hour can be threshed.

On Stand 151, No. 842, was shown a Road Roller with Searfier, as made by Sir W. G. Armstrong, Whitworth & Co., Ltd., 8 Great George Street, London, S.W.1. This was a very well designed and constructed engine, as one would expect from this firm, being of the petrol-paraffin type, and it is claimed that it is low-priced, and gives more efficient running on light loads than has been customary hitherto.

On Stand 163, No. 1067, Ruston & Hornsby, Ltd., of Lincoln and Grantham, exhibited a Pumping Plant driven by a Charcoal Gas Producer, mounted on a truck, and designed for use in those countries where coal is scarce and charcoal readily available. It was stated that, with the $1\frac{1}{2}$ h.p. engine, $2\frac{1}{2}$ lbs. of charcoal per hour would produce gas to pump 1,700 galls. per hour to a height of 100 ft.

The Swainson Pump Co., Ltd., of Newcastle-on-Tyne, on Stand 181, showed their Pump No. 1250, which, it is claimed, is useful for pumping either fresh water or liquid manure, or for drain-flushing, there being only two wearing parts, the piston and valve heart, and no rotary metal parts in the pump, which should give a long life with the slow working speed.

On Stand 206, No. 1570, was a Chaff-cutter shown by Robert Maynard, of Whittlesford, in which the "new idea" was the absence of the oscillating riddle generally used, the chaff being sifted by a riddle traversed by sweepers or tines arranged on a system of belts or bars. The whole machine seemed very stable, and there was no rocking or vibration, and therefore less wear and tear and trouble in actual working.

On Stand 211, Mr. R. Borlase Matthews showed a varied assortment of machinery ranging from a plant to make hay without sunshine to a Farmers' Wireless Telephone Receiver, and whilst the judges were not satisfied that in any one case there was sufficient "newness" to warrant the award of a medal, yet they feel that the industry and ingenuity of Mr. Matthews' efforts on behalf of the farming world are worthy of great commendation.

Perhaps the most notable of these exhibits was No. 1647, in which, by means of an electric blower Sirocco fan, air is forced through wooden pipes or boxes into a stack of hay, or, practically speaking, grass, and by a careful regulation of the temperatures the grass is converted into hay in the stack and the field work of haying done away with. It is questionable if such methods will be largely adopted as compared with the simple system of silage making now in vogue, though silage needs a more or less expensive plant in the form of a silo, wooden or otherwise.

The other exhibits on this stand were interesting, but do not call for special comment, except No. 1651, in which, by an electrically controlled clock, the electric lights of a hen-house are so worked as to give an artificial twilight, then eight hours of sleep,

and therefore a much longer day of artificial light, so that hens may feed longer and lay more eggs. Whether the constitution of the hen will stand the extra strain thus imposed remains to be proved.

Messrs. Bamfords Ltd., Uttoxeter, on Stand 213, showed a new Swath Turner and Side Rake, No. 1694, in which the improvements claimed are a new tine-head which is stronger, the machine is adjustable for varying widths of swath, and the tines are single in case of breakage, but work in pairs for the sake of weight.

The Potato Digger, No. 1695, on this stand, is a modification of existing patterns in that in place of a vertical or hanging grid, a horizontal grating is substituted. This consists of a number of curved steel spokes or arms radiating from a centre, which retain the lifted potatoes but allow the soil to fall through, the potatoes being dropped in a row about 16 in. to the side of the machine, which considerably lightens the task of gathering, and enables the farmer to lift row after row without gathering, and leave them for a time to dry. The tops are dealt with and got rid of by tines fixed for the purpose above the gathering tines.

The Wheat Granulator and Cutter, No. 1759, shown on Stand 216, by W. S. Barron & Son, Ltd., Gloucester, seemed to satisfactorily perform its duty of gritting or cutting wheat, by a series of opposing revolving vertical knives, so as to produce a very high-class poultry food, at a rate of 6 cwt. per hour, 2 h.p. being needed.

For the Two-wheeled Trailer, No. 1782, shown by the Eagle Engineering Co., Ltd., Warwick, on Stand 218, it is claimed that this arrangement gives extra weight on the draw-bar, a resulting extra grip on the driving wheels, and therefore the tractive effort is increased. The tractor has a low load-line, and whilst it is light in weight, it is asserted it can be backed if necessary. It can be removed and worked by horses by fixing a swivel wheel at the front end.

The Saunderson Tractor & Implement Co., Ltd., Bedford, are making a very praiseworthy attempt to rival the Fordson in putting on to the market a light Tractor, as shown on their Stand, No. 224, exhibit No. 1809, with a weight of 28 cwt., 12 h.p. on the draw-bar, and a three years' guarantee, at a price of £195. This seemed to be a well-designed machine, capable of ploughing three furrows as a rule, and having other small improvements, such as a cleaning device on the wheels, revolving seat, &c.

Exhibit No. 1814, on Stand 225, of Harrison, McGregor & Co., Ltd., Leigh, was a Potato Planter with Artificial Manure Power. Here a small hopper of about $\frac{1}{2}$ cwt. capacity has been added between the side of the seed table and the right-hand wheel; the amount of manure sown can be varied from 1 to 6 cwt. per acre. The main drive consists of a chain and sprockets

driven from the top of the wheel and it is the planter's foot which is in contact with the feed roller. A further improvement is that in the front axle, with lifting gear, which splits the ridge over the seed is planted. Other improvements claimed are vertical extensions for raising, and extending axles for different widths of drill.

On Stand 226, Ransomes, Sims & Jefferies, Ltd., Ipswich, showed a very compact and convenient Electric Crane, No. 1879, suitable for estate work, but we are afraid the price, £850, is a difficulty in these hard times. The crane is worked by two motors, one for each outside wheel, and is absolutely self-contained. With a 40-volt current it will lift up to 15 cwt. 40 ft. per minute, and one charging of the battery lasts a full day's work.

A further exhibition was the expanding Disc Harrow, No. 1880, for fruit gardens. The frame is 3 ft. 6 in. high, so as to pass over plants or bushes, such as raspberries. It can be altered for angle of discs or width of row. Eight discs are fitted in two groups of four. It is drawn by two horses, and is a strong, serviceable implement, at a price of £18.

On Stand 227, Geo. Henderson, of Edinburgh and Kelso, showed his Waverley Manure Distributor, the machine being almost identical with that shown at Cambridge, but having brass bushes, a device to prevent manure working down through the bushes to the gear-casings, and detachable spring fasteners to maintain the position of the star-shaped manure spreading wheels on the floor of the manure container or hopper; the springs also permit of the easy removal of the star wheels for cleaning purposes.

Ransomes, Sims & Jefferies had a further exhibit, No. 2504, on their Lawn Mower Machine Stand, No. 289. This is a neat little motor pusher for attachment to lawn mowers up to 24-in. cut.

The Cultivator shown by Motes Ltd., of Palace Chambers, Westminster, S.W.1, at the Cambridge show, was again exhibited this year, being exhibit No. 2599, on Stand 300, but beyond being strengthened, is very little altered or improved. This cultivator has all its times connected and compensating, so that they all work at one depth and in the same manner, with a continuous slight vibratory action.

On Stand 338, the Dairy Supply Co., Ltd., Museum Street, London, W.C.1, showed Tarbett's Positive Milk Holder, by which milk to be sold as "pasteurised" is held at a temperature not less than 145° or more than 150° for 30 minutes.

This complies with the regulations of the recent Milk Bill, and the machine itself may be described as a revolving segmental circular tank or holder. Every 7½ minutes one of the segments or divisions is emptied, the whole six being emptied once in 45

minutes. Every drop of milk is thus held the full 30 minutes, and 7½ minutes are allowed for filling and the same time for emptying each compartment, the holder revolving once every 45 minutes.

There are no supply or delivery pipes, the whole operation is automatic, and if the machine can be readily cleansed, in practice it should prove a useful dairy appliance, being well designed and constructed.

The Temperature Controller, No. 2681, on this stand, has as its governing feature a thermostat of methylated spirit. The milk only has contact with a plain tinned tube connected with the thermostat, from which leads a short copper tube to a valve controller, adjusting the valve continually by positive hydraulic pressure, only the requisite quantity of tempering medium passing to keep the proper temperature, the controller thus being actuated by the heat of the milk which it controls. A very similar principle, however, has been applied to other dairy machinery and exhibited at recent shows.

Messrs. Vipan & Headly, of Leicester, had two exhibits on their Stand, No. 339, the first, No. 2692, being a Milk Bottle Washing Machine. Whilst somewhat similar in use and construction to existing machines for this purpose, it was claimed that the price was extremely low for a machine of this capacity—1-2,000 bottles per hour—and that the size was smaller than usual, and available, therefore, for many more dairies.

The cleaning brushes were driven by a steam turbine, the cleansing seemed thorough, and a noticeable point was the handy catch for retaining the bottles in their crates whilst the operation was in progress.

The second exhibit was No. 2693, a Milk Bottle Filling Machine, some twenty bottles being filled simultaneously from a tank, the filling being governed by falling spring stoppers. The bottles, placed in a case, are raised by a lever up to these valves, forcing them open for the milk to flow. Directly the bottle is filled the spring valve closes, and there is no dripping. But the tank did not completely empty itself when tried, and requires some little improvement.

On Stand 342 was shown a small Butter-making Machine or Churn, No. 2733, by Corsini & Hutchins, 13 Distaff Lane, London, E.C.4. This is a quick-speed churn, reminding one of the Disc Churn of twenty to thirty years ago, the butter being produced by a rapid revolving of a vertical spindle with zinc horizontal plates in a wooden churn shaped like a bushel measure. It was claimed, and proved on trial, that butter could be churned in two minutes, and if the churn was improved by the addition of a lid, and the zinc double plates altered so as to be easier to clean and less wasteful of butter, the judges consider it worthy of further consideration.

The Milk Filter, No. 2754, shown on Stand 344, by T. Grayson, Derby, is not absolutely new, in that the idea that the weight of milk above shall not drive the dirt through the filter cloth has been previously adopted in other filters now well known. In the opinion of the judges, the filter was too small to be easily cleaned, and though under trial the filtration was satisfactory, other filters gave equally good results.

Several dry feeders for pigs were exhibited, the objection to all of them being their cost. They are strongly constructed and well finished, and must, at a time when pig husbandry is developing, reduce costs by their saving in labour; in the "Rationer," shown as No. 2958 on Stand 356, by W. Roberts & Sons, Dalton, Croft, Darlington, varying quantities being liberated daily or weekly by the action of a roller, the pigs working it out below.

On Stand 379, Alfred Herbert, Ltd., The Butts, Coventry, showed a new pattern, No. 3190, of their well-known "Dunley" feeders, the new principle being the adjustable hopper, which is shaken by the pigs working the swinging doors on the troughs, these closing to and preventing waste by vermin or rain when the pigs are not feeding.

Whilst on Stand 382, Capt. W. Elwin Napier, of Sandbach, showed a handy Feeder with a Rocking Hopper, No. 3201, which struck the judges as being more reasonable in cost and apparently efficient.

May & Butcher, Ltd., of Heybridge, Maldon, showed a Pig Weigher and Loader on Stand 359, No. 2998, a wooden frame carrying a crate, suspended from a 600-lb. spring balance for weighing, or from a steel wire which can be wound up by a handle to the level of a cart or wagon for loading. The price, £15, would appear too high, except in the case of very large pig farms.

Recent research as to the shallow seeding of corn has doubtless suggested the Seed Drill, No. 3110, shown on Stand 371, by Walter Dunn & Co., of Canterbury, in which wide coulters form a 2-in. seam, into which the seed is dropped from a 2-in. box, and covered up by flat 2-in. rollers which carry the weight of the drill, and followed by coulters which earth over the seed slightly.

The Busvan, No. 3261, shown on Stand 418, by Henry Garner, Ltd., of Birmingham, can hardly be described as an agricultural implement, but would seem to provide a comfortable, well-finished passenger bus which can be readily modified to carry a part or full load of goods.

Last in the catalogue came the Milking Machine shown by the De Laval Chadburn Co., Ltd., Buckingham Gate, London, S.W.1, being No. 3350 on Stand 448, but beyond improvements in details, this could hardly be treated as a "new implement."

A simple and effective main or governing pulsator is attached

to the suction pump, whilst individual smaller subsidiary pulsators are provided close to the teat-cups themselves, for which it is claimed a better milking is the result. This remains to be proved.

The treble set of rubber tubes is in our opinion a drawback, users of milking machines being well aware rubber is costly, perishable, and difficult to keep clean. Apart from this, the machine would seem to be well designed and efficient as a milker.

In conclusion, the Judges wish to thank the Steward of Implements, the Society's Engineer, and their assistants, for their kindly help and most excellent arrangements, which materially lightened their arduous duties.

WILLIAM BURKITT.

Grange Hill,
Bishop Auckland.

REPORT OF THE STEWARD OF DAIRYING, NEWCASTLE SHOW, 1923.

FARMERS' MILK COMPETITION.

THIS competition was carried out on somewhat similar lines to those adopted in the competition at Manchester in 1916. It was open to Farmers supplying milk daily from the Counties of Cumberland, Durham, Northumberland and Westmorland to places within the City and County of Newcastle-on-Tyne and the County Borough of Gateshead.

The Classes and Prizes were as follows:—

Class 1.—Farmers sending by road or rail 31 gallons of milk and upwards in two deliveries, morning and evening. First Prize, £6 6s. Second Prize, £3 3s.

Class 2.—Farmers sending by road or rail 15 to 30 gallons of milk in two deliveries, morning and evening. First Prize, £4 4s. Second Prize, £2 2s.

Awards of Merit were also given:—

To those obtaining 70 points and upwards, First grade.

" " 54-69 points, Second grade.

" " 39-53 points, Third grade.

The samples of milk were taken, without notice, between May 25 and June 22, by the Local Authorities.

The points on which the awards were made were as follows:—

4 points for every 1 per cent. fat.

2 " " 1 per cent. solids other than fat.

20 " " as a maximum for comparative freedom from *Bacillus Coli*.

20 points for comparative freedom from other bacterial contamination.

Milks were disqualified from receiving a Prize or Award of Merit for any of the following reasons:—

- (a) Showing less than 3 per cent. fat at any milking.
- (b) " " " " 8·5 per cent. solids other than fat at any milking.
- (c) Not obtaining any points for comparative freedom from B. Coli.
- (d) Not obtaining any points for comparative freedom from other bacterial contamination.

The points awarded for comparative freedom from B. Coli were:—

B. Coli not detected in 1 c.c.	. . . . .	20 points.
" " " " 0·1 c.c.	. . . . .	10 "
" " " " 0·01 c.c.	. . . . .	5 "

The points awarded for comparative freedom from other bacterial contamination were:—

Count not exceeding 30,000 organisms per c.c.	. . . . .	20 points.
" " " " 100,000 "	" " " "	10 "
" " " " 200,000 "	" " " "	5 "

The Prizes in CLASS I were awarded as follows:—

First Prize.—Mr. G. Y. McNay, Brunton, Lesbury.

Second Prize.—Mr. John Whaley, Angerton Steads, Northumberland.

CLASS II.

First Prize.—Mr. Arthur Woodhouse Price, Dilston Jersey Farm, Corbridge-on-Tyne.

Second Prize.—Mr. Hugh Dalziel, Barron House, Gilsland.

Awards of Merit were given to the undermentioned competitors:—

GRADE I.

Edward Bolam, Turpins Hill, Ponteland.
 Robert Brown, Cheerington Moor, Widdrington.
 Thomas R. Hemsley, Bullocks Hall, Red Row.
 John Mattinson, Dryholme, Silloth.
 William Watson, Farlam House, Brampton Junction.
 George Winter, 221 Brighton Road, Bentshan, Gateshead.
 Thomas Murray, Gallows Hill Farm, Cambo.

GRADE II.

John J. Baird, Balladoyle, Silloth.
 William Brewis, Wooden Farm, Lesbury.
 George Dalziel, Triesmain, Low Row, Carlisle.
 John L. Henderson, Keepwick, Wall-on-Tyne.
 Andrew Luke, Eshott Farm, Felton, Morpeth.
 Thomas Westray Paisley, Moss Side, Kirkbride.
 J. B. Ralph, Dissington Reo House, Dalton.
 Bartholomew S. Ridley, 106 Dunston Road, Gateshead.
 William and James Ridley, Broomley, Stocksfield.
 F. H. Sanderson, Eshott Home Farm, Felton, Morpeth.
 R. Douglas Watson, Preston Mains, Chathill.
 James Wight & Sons, Low Angerton Farm, Morpeth.
 Messrs. Woodmass, Howard House, Gilsland, Carlisle.

TABLE I
CLASS I.

Number of Catalogue	Daily Yield of Milk	Fat Percentage			Solids-not-Fat Percentage			Points			Awards	Remarks
		Morning	Evening	Average	Morning	Evening	Average	Average Solid- Fat Percentage	B. Coll. Present Percentage	Freedom from Bacterial Contam- ination	Total Points	
12	Gallons	4.70	3.88	4.28	9.38	9.21	9.285	17.04	18.57	20	75.61	First Prize
13	3.90	4.70	3.91	4.30	9.13	8.88	8.885	18.80	17.77	20	74.51	"
14	64	3.70	4.30	4.00	9.13	9.08	9.105	18.80	18.15	20	74.51	"
15	44	3.40	3.55	3.475	8.61	8.90	8.755	14.20	18.10	20	72.35	Award of Merit
16	31	3.35	3.32	3.335	8.61	8.90	8.755	14.20	18.10	20	72.35	"
17	31	3.65	3.82	3.435	9.10	9.18	9.14	18.74	18.28	20	71.10	Award of Merit
18	78-87	3.65	3.82	3.435	8.63	8.76	8.695	18.70	18.05	20	70.75	"
19	25	3.00	3.35	3.175	8.15	8.29	8.22	12.70	18.05	20	68.74	Award of Merit
20	82	3.40	3.55	3.475	8.15	8.29	8.22	12.70	18.05	20	68.74	"
21	110	3.45	4.00	3.725	9.11	9.25	9.18	18.40	18.38	15	68.21	Award of Merit
22	60	4.00	3.70	3.85	8.71	9.10	8.905	18.40	18.24	15	68.21	"
23	30	3.50	4.00	3.75	8.85	9.10	8.975	18.40	18.24	15	68.21	"
24	11	3.55	4.12	3.835	9.10	9.11	9.105	18.40	18.24	15	68.21	"
25	80-85	3.75	4.72	4.235	9.22	9.27	9.245	18.34	18.41	10	67.84	Award of Merit
26	17	3.70	4.16	3.93	8.77	9.06	8.915	18.34	18.41	10	67.84	"
27	57	3.20	4.55	3.875	9.28	9.19	9.235	18.90	18.62	10	65.83	Award of Merit
28	15	3.63	3.55	3.59	9.08	8.89	8.985	18.90	18.47	10	65.83	"
29	11	3.10	3.72	3.41	8.63	8.90	8.765	18.90	18.47	10	65.83	"
30	340	4.50	3.70	4.10	9.00	9.20	9.10	18.90	18.47	10	65.83	"
31	80	3.80	4.52	4.16	9.20	9.04	9.12	18.40	18.24	10	63.01	Award of Merit
32	7	2.74	3.45	3.095	8.05	8.25	8.15	18.60	18.19	0	62.09	Disqualified
33	108-120	3.10	3.52	3.31	8.09	8.14	8.115	18.24	18.15	0	62.09	Disqualified
34	60	3.50	3.44	3.47	8.26	8.01	8.135	18.65	18.27	0	42.18	Disqualified

CLASS II.

Number of Catalogue	Daily Yield of Milk	Fat Percentage			Solids-not-Fat Percentage			Points			Awards	Remarks
		Morning	Evening	Average	Morning	Evening	Average	Average Solid- Fat Percentage	B. Coll. Present Percentage	Freedom from Bacterial Contam- ination	Total Points	
29	Gallons	5.70	6.05	5.875	10.05	9.78	9.905	26.40	19.41	20	85.41	First Prize
30	25.4	5.00	4.45	4.725	9.54	8.80	9.17	18.42	18.61	20	82.03	Second Prize
31	25.4	5.00	4.45	4.725	9.54	8.80	9.17	18.42	18.61	20	82.03	Award of Merit

The quality of the milk is shown by the following average figures :—

No. of herds.	Daily milk yield.	Average fat per cent.	Average solids not fat per cent.
29	59 gallons.	3.74	9.096

In only two cases were milks found to be deficient in fat in the morning's milk, and in no cases were milks below 8.5 in solids not fat, while, of the 58 individual samples taken, only 1 contained more than the number of germs permitted for certified milk of the highest official Government Grade.

In no cases were points given to any milk the bacteria in which exceeded the limit set for Grade A milk.

It is also worthy of note that, so far from any difficulty being experienced in keeping the count below 30,000 germs per cubic centimetre, 5 samples showed below 500 and 15 below 1000.

In the search for *Bacillus Coli*, an organism that comes direct from excrement, 12 out of 29 competitors obtained full marks, and only 3 were disqualified for having failed to attain the standard for Grade A milk.

The results of the competition were largely determined by the fat content of the milks, since nearly all of them were of such excellent quality bacterially.

As the samples of milk were all taken without notice, and from the bulks of milk as delivered, it is obvious that the standard for graded milk is well within the compass of an average farmer who insists on his milkers and dairy servants carrying out the ordinary rules of cleanliness, even although his byres may not be too good structurally.

Newcastle is evidently one of the few places where definite steps have been taken to ascertain the actual quality of the milk supplied to the public, and the Health Department of the City and County of Newcastle-on-Tyne are to be congratulated on the result of this competition, which has shown in no uncertain way that the efforts of the Department to procure a clean and wholesome supply of milk have been eminently successful.

The examination of the samples was undertaken by Dr. M. A. C. Buckell, of the Newcastle-on-Tyne College of Medicine of the University of Durham, for Professor H. J. Hutchens, the head of the Bacteriological Department, and by Mr. S. Hoare Collins, M.Sc., Lecturer on Agricultural Chemistry in the Armstrong College, University of Durham.

The arrangements for taking samples of the milk and for transmitting them to the experts were made by Dr. Harold Kerr, of the Health Department, Newcastle-on-Tyne. To all these gentlemen the thanks both of the Royal Agricultural Society and of the farmers competing in the trials are specially due.

MILK YIELD TRIALS (CATTLE CLASSES 222 to 232).

Out of 155 entries for these trials only 92 cows were forthcoming, rather a small proportion, considering the heavy expenses that are incurred in providing facilities for carrying out the trials and the butter test competitions.

Out of this number, 13 cows gave milk showing less than 3 per cent. fat on the average of the two milkings, as follows :—

2 Shorthorns	out of an entry of 13.	
1 Non-Pedigree Shorthorn	" " "	3.
1 Lincoln Red Shorthorn	" " "	9.
6 British Friesians	" " "	15.
1 Jersey	" " "	14.
1 Kerry	" " "	7.
1 Dexter	" " "	7.

Had the disqualification been enforced on each separate milking, the numbers would have been much higher, as 47 cows gave milk in the morning's milking containing less than 3 per cent. fat, as below :—

7 Shorthorns	out of an entry of 13.	
3 Non-Pedigree Shorthorns	" " "	3.
5 Lincoln Red Shorthorns	" " "	9.
3 Red Polls	" " "	7.
14 British Friesians	" " "	15.
5 Ayrshires	" " "	9.
2 Guernseys	" " "	7.
2 Jerseys	" " "	14.
3 Kerrys	" " "	7.
3 Dexters	" " "	7.

I have called special attention to these results, as they tend to show that milk containing less than 3 per cent. fat is sold to the public, a fact attributable largely to the craving for heavy milk records.

The Champion Prizes offered at the three last previous shows were again forthcoming, the prize-winners being as below :—

A.—For Cows of the Dairy Shorthorn, Lincolnshire Red Shorthorn, Devon, South Devon, Longhorn, Red Poll, and British Friesian Breeds.

Champion Prize, £30.—1462 G. Holt Thomas's British Friesian, Kingswood Myrtle Leaf.

Reserve Number, £5.—914 Major S. P. Yates's Dairy Shorthorn, Foggethorpe Primrose.

B.—For Cows of the Ayrshire, Jersey and Guernsey Breeds.

Champion Prize, £20.—1636 Sir James Remnant's Guernsey, Princess of Caillioterie.

Reserve Number, £5.—1630 A. Chester Beatty's Guernsey, Lizette of St. Catherine.

C.—For Cows of the Kerry and Dexter Breeds.

Champion Prize, £10.—1734 The Elmhurst Farming and Trading Co.'s Kerry, Gort Curley 9th.

Reserve Number, £5.—1808 Alfred C. King's Dexter, La Mancha Madeline.

Table II. gives the full report of the trials with the awards in each Class. Table III. shows the average results of each breed.

TABLE II.—MILK-YIELD CLASSES AT NEWCASTLE-ON-TYNE, 1923.

No. in challenge	Exhibitor	Name of cow	Live weight	Date of birth	Date of last calving	No. of days in milk	Date of last service	Total pounds 54 hours	Fat per- cent age	Points			Awards and Remarks	
										Milk	Lacta- tion	Total		
Class 222														
Class 222														
890	Capt. Hon. E. A. FitzRoy	Dairy Shortlands	1510	Apr. 15, 1912	June 5	30	—	71	0	3.75	71.00	15.00	NH	99.00
905	J. Pierpont Morgan	Cockburn Barrington 2nd	1506	June 30, 1914	May 28	43	—	70	4	8.45	39.25	13.80	NH	53.35
909	J. M. Rickland	Keyingham Tulip 6th	1313	June 21, 1915	June 12	23	—	70	4	8.52	70.25	14.08	NH	84.33
912	Duke of Westminster	Rosy	1465	June 17, 1915	June 9	28	—	83	0	3.75	69.00	15.00	NH	78.00
913	Capt. A. S. Wills	Forbury Fougathorpe 2nd	1417	Sept. 11, 1914	June 2	33	—	83	12	3.87	69.25	15.48	NH	77.23
914	Major S. J. Yates	Fougathorpe Friars	1256	Sept. 4, 1913	June 23	41	—	83	3	3.87	69.25	15.48	NH	89.58
922	W. L. Lea	Willy Woman 2nd	1494	July 22, 1918	June 18	17	—	45	12	3.65	45.75	14.60	NH	60.35
924	La-Col. R. Moslyn	Rosedoom	1380	Nov. 20, 1917	May 13	53	—	91	0	2.85	51.00	11.40	1.30	43.70
925	J. G. Peel	Combebank Musical	1456	Oct. 29, 1918	June 1	34	—	47	8	3.35	47.50	13.40	NH	60.90
933	Duke of Westminster	White Heather	1358	Jan. 7, 1917	June 9	26	—	59	8	3.45	59.50	9.80	NH	69.90
934	Capt. Arnold S. Wills	Thornby Fougathorpe 7th	1424	June 3, 1917	June 10	30	—	82	12	3.35	62.75	13.40	NH	76.15
935	Duke of Westminster	Eaton Seraphine	1358	Jan. 3, 1916	June 9	26	—	48	4	3.15	48.25	12.60	NH	60.85
954	John Britten	Champion Duchess	1286	July 15, 1920	June 18	17	—	41	10	4.75	41.62	19.00	NH	60.62
Class 223														
Class 223														
961	James Batten & Son	Stella Queen	1340	Aug. 22, 1917	June 8	27	—	73	12	3.65	73.75	14.40	NH	88.95
962	C. J. Beshen	Fallo Queen	1344	Aug. 29, 1917	June 17	18	—	49	12	3.60	49.75	14.40	NH	84.35
964	J. Pierpont Morgan	Empress 8th	1516	Mar. 10, 1916	May 10	56	—	47	4	2.82	47.25	11.28	1.60	60.13
Class 224														
Class 224														
1000	John Evans & Son	Finch, Red Shortlands	1484	Mar. 14, 1916	June 3	32	—	67	12	4.42	67.75	17.68	NH	85.43
1010	John Evans & Son	Burton Cherry 3rd	1547	Oct. 6, 1914	May 21	45	—	62	8	4.40	62.50	13.60	NH	76.80
1019	Stanley Bindell	Benish Ada 2nd	1446	Nov. 18, 1914	May 30	86	—	63	4	2.40	63.25	10.40	NH	79.65
1020	Stanley Bindell	Wood Walton Rosamary	1557	May 12, 1916	May 24	42	—	44	4	3.90	44.25	14.40	NH	58.85
1023	George Coleman	Burton Diligent	1519	Oct. 1, 1917	June 3	32	—	59	0	3.55	59.00	14.20	NH	73.20
1024	John Evans & Son	Burton Diligent 6th	1519	Oct. 1, 1917	June 3	32	—	59	0	3.55	59.00	14.20	NH	73.20
1025	John Evans & Son	Shrew Rose	1331	Sept. 4, 1913	Apr. 16	78	—	67	8	3.82	67.50	13.28	3.60	94.58
1031	La-Col. Sir A. G. Wedgall	Sudbrook 129C	1666	June 23, 1914	May 22	44	—	57	12	4.12	57.75	16.48	4.0	74.63
1032	La-Col. Sir A. G. Wedgall													

17 MILK YIELD CLASSES AT NEWCASTLE-ON-TYNE, 1923—continued.

TABLE II.—MILK-YIELD RECORDS.														
No. in Challenge	Exhibitor	Name of cow	Live weight	Date of birth	Date of last cull	No. of cows milked	Days in Service	Total milk yield in 24 hours	Fat per- cent. age	Milk	Fat cont. in cwt. x 4	Exhi- bit tion	Total	Awards and Remarks
Class 225														
1129	Walker Hunt	South Devons Milkmaid 9th	1533	Sept. 2, 1916	1923	Mar. 29	98	June 4	lb. oz. 53 0	4 50	53.00	18.00	5-80	76-80 First Prize
Class 226														
1210	Lt.-Col. Sir Mervyn Cecil, 1st Bn. Buffs	Red Fells Saulbours Minerva	1520	Nov. 29, 1913	May 6	60	—	67	0	3-07	67.00	15-88	2-00	54.68 Second Prize
1211	H. Munro Caxley	Henham Passion	1155	Aug. 19, 1915	Feb. 15	143	April 2	40	3-02	40.00	12-08	10-20	62.98	H.C.
1213	J. B. Dinwoodie	Shoford Star Duchess 121st	1405	Aug. 19, 1915	May 16	147	—	60	4	3-15	50-25	12-40	10-20	H.C.
1214	Mrs. Fook	Harfield	1247	Aug. 27, 1917	Feb. 24	131	May 1	87	12	3-77	57-75	12-88	—	59.63 First Prize
1217	Exors. of late J. A. Manson	Greenhall Red Berry	1303	Aug. 27, 1911	May 25	41	—	78	12	3-22	75.75	12-88	—	91.73
1221	Major J. A. Morrison	Saulbours Comdt.	1421	Aug. 10, 1916	Apr. 4	92	June 29	43	12	4-07	43-75	16-23	5-20	65.23 H.C.
1223	Capt. Alan Richardson	Tivetshall Lena	1141	Mar. 11, 1914	Apr. 12	143	April 29	42	8	3-75	42.50	15-00	10-30	87.80 Third Prize
Class 227														
1445	A. & J. Brown	Bedles Galloway	1440	May 2, 1918	May 24	42	—	70	8	2-75	75-27	11-00	—	90.57 Fat below Standard
1446	Edwards Colburn	Bedles Galloway	1460	Dec. 14, 1919	May 24	42	—	70	12	2-55	48-75	12-00	2-10	68.85 H.C.
1446	Haydon Dot	Bedles Galloway	1288	Oct. 17, 1916	May 24	57	—	87	4	3-17	87-25	12-68	—	79.98 H.C.
1447	Sgt. W. A. Winton	Bedles Galloway	1288	Oct. 17, 1916	May 24	57	—	87	4	3-17	87-25	12-68	—	79.98 H.C.
1453	Sweetstone Beauty	Wychston Beauty	1253	Oct. 8, 1916	May 21	47	May 30	73	10	3-30	78-82	13-20	3-20	73.82 Fat below Standard
1458	Albert & Woodfield	Wychston Beauty	1253	Oct. 8, 1916	May 21	47	—	82	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1407	June 30, 1918	May 19	47	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—	—	76.20 Fat below Standard
1457	Thomas & Chantaine	Colton Carcas	1218	Oct. 3, 1919	Apr. 8	27	—	83	12	2-55	66-50	—		

TABLE II.—MILK-YIELD CLASSES AT NEWCASTLE-ON-TYNE, 1923—continued.

No. in Class	Exhibitor	Name of cow	Live weight	Date of birth	Date of last calf	No. of days in milk	Date of last service	Total milk 34 days	Fat per- cent. age	Milk	Fat cont. per cent. x 4	Lacta- tion	Total	Awards and Remarks
Class 228														
1580	A. V. Allan	Attenbar Juliana	993	Jan. 2, 1919	June 11, 1923	24	1923	54	8	4.80	54.50	10.20	NH	73.70 H.C.
1581	The Hon. G. Corbett	Autenbar Yellow Kate	1029	Jan. 1, 1919	May 22	44	—	56	0	3.25	56.00	13.00	—	69.40 H.C.
1585	W. L. Ferguson	Archwood Nan	1082	Mar. 20, 1918	Apr. 4	92	—	53	8	3.90	53.50	15.60	5.00	74.10 H.C.
1586	William Gilson	Woodside Nellie	1083	May 22, 1918	June 12	23	—	51	12	4.07	51.75	10.28	NH	68.03 H.C.
1589	William Gilson	Woodside Annie	1035	Jan. 2, 1918	June 13	22	—	63	12	3.95	60.75	14.60	NH	65.35 H.C.
1592	A. & A. Kirkpatrick	Auchinsky Meg	1103	Feb. 15, 1918	June 13	20	—	63	12	3.20	63.12	12.80	NH	75.92 H.C.
1601	F. H. Sanderson	Brighland Pansy 5th	990	Apr. 6, 1918	June 13	22	—	43	12	3.05	43.75	12.20	NH	55.95 First
1602	F. H. Sanderson	Newlands Sundowner	1180	Jan. 17, 1918	Apr. 24	72	—	43	2	3.25	43.75	13.60	3.00	74.95 Second Prize
1609	Mungo Sloan	Douglas Hall Sundowner	703	Sept. 19, 1920	Apr. 20	76	June 1	43	2	3.25	43.12	13.00	3.60	59.72 H.C.
Class 229														
1633	A. Chester Beatty	Lizette of St. Catherine	957	June 20, 1913	Apr. 11	85	—	56	8	4.47	56.50	18.28	4.50	77.23 Second Prize and Re-serve for Champion H.C.
1632	J. B. Body	Lynchmore Rosy	1003	Aug. 12, 1918	May 28	43	June 16	25	0	5.12	25.00	20.43	7.30	56.38 H.C.
1633	W. Duncels	Wickham Rose of Rouge	961	Aug. 1, 1917	Mar. 8	119	—	37	12	4.85	37.75	19.40	—	80 H.C.
1635	Mrs. Jervoise	Ruby 4th of Le-Mont Durant	1134	Feb. 5, 1915	Apr. 13	83	June 25	34	12	4.45	34.75	17.80	4.30	56.85 First Prize and Champion Prize
1636	Sir James Remond, Bart.	Princess of Calliope	1124	Mar. 7, 1912	June 4	31	—	64	4	3.77	64.25	15.08	NH	62.75 Third
1637	G. P. Sanday	Dowrie Lauder Beauty 2nd	1001	Sept. 2, 1917	June 18	17	—	44	12	4.50	44.75	18.00	NH	69.75 H.C.
1644	G. P. Sanday	Puddington Lily of Mont	961	Nov. 7, 1920	Apr. 27	69	June 6	28	12	4.57	28.75	18.68	2.40	50.33 H.C.
Class 230														
1683	Mrs. G. J. Austin	Wonders Juliette	840	May 10, 1919	May 13	65	—	33	12	4.92	33.75	10.68	2.50	55.98 H.C.
1684	Major C. J. Balfour	Wonders Juliette	940	Feb. 24, 1914	Apr. 10	86	—	27	0	5.05	27.00	20.20	4.00	51.80 H.C.
1685	Major C. J. Balfour	Moona	948	Feb. 24, 1914	Apr. 10	86	—	27	0	5.05	27.00	20.20	4.00	51.80 H.C.
1686	Mrs. Harry Briggs	Lily of the Valley	838	Oct. 28, 1917	Apr. 25	71	—	33	8	5.57	33.50	22.28	3.10	58.88 H.C.
1692	Mrs. Evelyn	Fairlane Eusey	1025	Aug. 8, 1916	Jan. 11	175	April 8	47	8	4.50	47.50	16.80	12.00	70.30 Prize and Champion Prize
1693	Miss Marjorie	Gloria June	850	June 13, 1919	May 17	49	—	49	4	9.35	49.25	13.40	9.00	63.55 H.C.
1701	J. H. N. Roberts	Ora's Gem	749	Feb. 22, 1919	Apr. 25	71	—	20	12	4.70	20.75	18.90	3.10	42.65 H.C.

TABLE II.—MILK-YIELD CLASSES AT NEWCASTLE-ON-TYNE, 1923—continued.

No. in Catalogue	Babbiator	Name of cow	Live weight	Date of birth	Date of last calv.	No. of days milked	Date of last service	Total milk in pails	Fat per cent. avg.	Pounds			Awards and Remarks
										Milk	Fat milk x 4	Total	
Class 230													
1708	Laurence E. Tubbs	<i>Jersey (continued)</i>	1b.	Sept. 23, 1919	1923	131	June 6	1b. 02	4.00	49-75	10-00	7-40	73-15
1704	R. Bruce Ward	Osley	822	Sept. 4, 1916	May 11, 1923	55	June	52	3-90	42-50	15-00	1-50	50-60
1706	R. Bruce Ward	Evergreen	889	July 2, 1916	May 11, 1923	54	June	41	0 2-55	41-00	11-40	1-40	53-80
1707	R. Bruce Ward	Maytham Pauline	727	July 20, 1917	May 12, 1923	54	June	37	4 3-30	37-50	17-20	12-00	66-70
1715	J. H. N. Roberts	Miranda's Lass	728	Nov. 5, 1919	Jan. 26, 1923	160	April 1	37	8 4-30	37-50	17-20	12-00	66-70
1716	J. H. N. Roberts	Miranda's Lass	728	Nov. 5, 1919	Jan. 26, 1923	160	April 1	37	8 4-30	37-50	17-20	12-00	66-70
1717	J. H. N. Roberts	Miranda's Lass	728	Nov. 5, 1919	Jan. 26, 1923	160	April 1	37	8 4-30	37-50	17-20	12-00	66-70
Class 231													
1764	Elmhurst Farming & Trading Co., Ltd.	<i>Kerry</i>	947	May 14, 1915	Mar. 6, 1923	121	June 12	40	12 3-52	49-75	15-28	8-00	73-63
1765	Elmhurst Farming & Trading Co., Ltd.	Gort Curley 6th	905	Jan. 24, 1916	June 1, 1923	34	June 12	39	12 3-55	39-75	14-20	NH	53-95
1767	J. W. Towler	Gort Primrose 11th	837	1912	June 17, 1923	18	June 12	46	4 8-05	46-25	12-20	NH	58-45
1768	J. W. Towler	Wadlands Buttermilk	895	Apr. 18, 1918	May 11, 1923	65	June 12	33	0 4-02	32-25	12-40	1-50	51-23
1769	J. W. Towler	Wadlands Buttermilk	895	Apr. 18, 1918	May 11, 1923	65	June 12	33	0 4-02	32-25	12-40	1-50	51-23
1770	Capt. Nelson Zambra and C. W. Milne	Casleburgh Cowally 4th	931	Mar. 5, 1917	May 14, 1923	52	June 12	40	4 2-46	40-25	6-80	1-20	51-05
1771	Marchioness of Londonderry	Springfield Fignort	705	Aug. 31, 1920	Mar. 8, 1923	119	June 20	25	4 4-00	25-25	16-00	7-90	49-15
Class 232													
1804	Mrs. F. A. Brown	<i>Friesian</i>	549	1919	Apr. 28, 1923	68	June 12	30	4 3-20	30-25	12-80	2-80	45-95
1805	W. Lindsey Eversard	Diana of Buxton Hill	623	Oct. 23, 1917	June 4, 1923	31	June 12	30	0 2-90	30-00	11-6	NH	41-80
1806	W. Lindsey Eversard	Fillingley Favourite	784	Mar., 1913	May 9, 1923	57	June 12	43	3 3-55	43-50	14-80	1-70	59-80
1808	Alfred C. King	La Mancha Madeline	595	Mar., 1913	May 15, 1923	51	June 12	43	3 3-55	43-50	14-80	1-70	59-80
1809	Mrs. C. L. Piskard	Gort Primrose 7th	603	Apr. 24, 1916	June 9, 1923	26	June 12	36	4 4-70	36-25	18-80	NH	56-05
1811	Mrs. C. L. Piskard	Gort Primrose 7th	603	Apr. 24, 1916	June 9, 1923	26	June 12	36	4 4-70	36-25	18-80	NH	56-05
1813	W. Lindsey Eversard	Brookhurst Woodbine	623	Feb. 9, 1920	Mar. 29, 1923	98	June 12	24	5 5-30	24-50	13-40	5-60	48-70
1814	Lady Kathleen Hare	Brookhurst Woodbine	623	Feb. 9, 1920	Mar. 29, 1923	98	June 12	24	5 5-30	24-50	13-40	5-60	48-70

TABLE III.—Average Results obtained by Cows of different Breeds in the Milk Yield Classes.

No. of cows Competing	No. of Cows Entered	Breed	Live Weight	Days in Milk	Milk	Fat per cent	Points
			Lb.		Lb. oz.		
13	31	Shorthorn	1399	30½	57 4½	3.52	71.51
9	13	Lincoln Red Short-horn	1499	48	58 12½	3.57	74.23
1	2	South Devon . . .	1533	98	53 0	4.50	76.80
7	11	Red Poll	1332	94	51 6½	3.48	70.73
15	36	British Friesian . .	1412	50	66 0½	3.04	79.22
9	13	Ayrshire	1019	44	52 12½	3.60	68.57
7	8	Guernsey	1006	62	42 1½	4.49	62.91
14	20	Jersey	860	85	37 9½	4.39	58.70
7	8	Kerry	866	59½	37 3½	3.42	53.56
7	9	Dexter	672	57	32 14½	3.69	49.74
3	3	Non-Pedigree Dairy Shorthorn . . .	1447	33	56 14½	3.35	70.87

BUTTER TESTS (CLASSES 233A & B).

Only 68 animals were present out of an entry of 112 to compete for the Butter Test Prizes, and of these 30 received no awards, as their milk showed a butter ratio of over 30 lb., as follows :—

6 Shorthorns	out of 12 received no award.
4 Lincoln Red Shorthorns	" " 9 " " "
2 Red Polls	" " 3 " " "
8 British Friesians	" " 9 " " "
3 Ayrshires	" " 5 " " "
1 Guernsey	" " 4 " " "
1 Jersey	" " 14 " " "
3 Kerrys	" " 6 " " "
2 Dexters	" " 2 " " "

The cattle were weighed on Tuesday evening, July 3, and divided into the two Classes (A and B). Milking out in this and in the milk yield section took place on Wednesday, July 4, at 5 p.m.

Full particulars of the trials are given in Table IV, and the average results obtained by the various breeds in Table V.

CLASS 233B—COWS NOT EXCEEDING 900 LB. LIVE WEIGHT.													
Owner		Breed		Date of Birth		Date of Weighing		Weight		Height		Remarks	
Albert W. Hoffman	1468	British Freestone	1358	Feb. 10, 17	June 21	74	—	79, 13	1	51	60.61	21.93	No award
Wm. J. Allen	1469	British Freestone	1359	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1470	British Freestone	1360	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1471	British Freestone	1361	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1472	British Freestone	1362	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1473	British Freestone	1363	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1474	British Freestone	1364	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1475	British Freestone	1365	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1476	British Freestone	1366	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1477	British Freestone	1367	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1478	British Freestone	1368	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1479	British Freestone	1369	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1480	British Freestone	1370	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1481	British Freestone	1371	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1482	British Freestone	1372	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1483	British Freestone	1373	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1484	British Freestone	1374	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1485	British Freestone	1375	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1486	British Freestone	1376	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1487	British Freestone	1377	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1488	British Freestone	1378	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1489	British Freestone	1379	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1490	British Freestone	1380	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1491	British Freestone	1381	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1492	British Freestone	1382	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1493	British Freestone	1383	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1494	British Freestone	1384	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1495	British Freestone	1385	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1496	British Freestone	1386	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1497	British Freestone	1387	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1498	British Freestone	1388	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1499	British Freestone	1389	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1500	British Freestone	1390	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1501	British Freestone	1391	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1502	British Freestone	1392	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1503	British Freestone	1393	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1504	British Freestone	1394	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1505	British Freestone	1395	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1506	British Freestone	1396	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1507	British Freestone	1397	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1508	British Freestone	1398	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1509	British Freestone	1399	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1510	British Freestone	1400	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1511	British Freestone	1401	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1512	British Freestone	1402	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1513	British Freestone	1403	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1514	British Freestone	1404	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1515	British Freestone	1405	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1516	British Freestone	1406	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1517	British Freestone	1407	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1518	British Freestone	1408	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1519	British Freestone	1409	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1520	British Freestone	1410	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1521	British Freestone	1411	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1522	British Freestone	1412	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1523	British Freestone	1413	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1524	British Freestone	1414	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1525	British Freestone	1415	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1526	British Freestone	1416	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1527	British Freestone	1417	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1528	British Freestone	1418	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1529	British Freestone	1419	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1530	British Freestone	1420	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1531	British Freestone	1421	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1532	British Freestone	1422	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1533	British Freestone	1423	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1534	British Freestone	1424	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1535	British Freestone	1425	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1536	British Freestone	1426	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1537	British Freestone	1427	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1538	British Freestone	1428	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1539	British Freestone	1429	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1540	British Freestone	1430	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1541	British Freestone	1431	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1542	British Freestone	1432	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1543	British Freestone	1433	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1544	British Freestone	1434	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1545	British Freestone	1435	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1546	British Freestone	1436	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1547	British Freestone	1437	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1548	British Freestone	1438	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1549	British Freestone	1439	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1550	British Freestone	1440	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1551	British Freestone	1441	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1552	British Freestone	1442	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1553	British Freestone	1443	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1554	British Freestone	1444	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1555	British Freestone	1445	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1556	British Freestone	1446	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1557	British Freestone	1447	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1558	British Freestone	1448	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1559	British Freestone	1449	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1560	British Freestone	1450	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1561	British Freestone	1451	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1562	British Freestone	1452	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1563	British Freestone	1453	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1564	British Freestone	1454	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1565	British Freestone	1455	Feb. 9, 20	June 21	74	—	14, 4	1	51	60.61	21.93	No award
Wm. J. Allen	1566												

NOTE. *Butterfat is equivalent to the number of lb. of milk required to make 1 lb. of butter. Ten lb. of milk are reckoned as equal to an imperial gallon.

No award; pursue ON.

TABLE V.—Average Results obtained with the Cows in the Butter Test Classes.**CLASS 233A.—EXCEEDING 900 lb. LIVE WEIGHT.**

No. of cows Competing.	Breed	Live weight	Days in milk	Milk		Butter		Ratio	Points
		Lb.		Lb.	oz.	Lb.	oz.	Lb.	
12	Shorthorn	1408	31	58	9 $\frac{1}{2}$	1	12 $\frac{1}{2}$	32.90	28.50
1	Non-Pedigree Shorthorn	1484	18	49	12 $\frac{1}{2}$	1	13 $\frac{1}{2}$	26.75	29.75
9	Lincoln Red Shorthorn .	1499	48	58	12 $\frac{1}{2}$	1	15 $\frac{1}{2}$	29.62	32.55
1	South Devon	1533	98	53	0	2	4 $\frac{1}{2}$	23.39	42.05
3	Red Foll	1274	107	43	8	1	2 $\frac{1}{2}$	37.79	25.12
1	Belted Galloway	1323	30	56	4	1	15	29.03	31.00
9	British Friesian	1445	48	68	7 $\frac{1}{2}$	1	11 $\frac{5}{8}$	40.61	27.81
5	Ayrshire	1027	22	53	1 $\frac{1}{2}$	1	15 $\frac{3}{4}$	27.00	31.45
3	Guernsey	1086	43	47	14 $\frac{3}{4}$	1	12 $\frac{1}{2}$	27.13	28.55
4	Jersey	975	126	37	4	1	14 $\frac{1}{2}$	20.86	38.66
4	Kerry	929	56	41	7	1	4 $\frac{1}{2}$	31.47	22.19

CLASS 233B.—NOT EXCEEDING 900 lb. LIVE WEIGHT.

1	Ayrshire	763	76	43	2	1	5 $\frac{1}{2}$	32.09	25.10
1	Guernsey	864	69	28	12	1	4 $\frac{1}{2}$	22.16	23.65
10	Jersey	801	72	35	11 $\frac{1}{2}$	1	8 $\frac{1}{2}$	23.33	27.70
2	Kerry	821	36	34	12	1	2 $\frac{1}{2}$	29.46	18.87
2	Dexter	621	47	33	4	0	14	38.00	14.70

MILK YIELD TRIALS (GOATS, CLASSES 247 AND 248).

The number of goats competing in these trials was 20, out of an original entry of 29. These were milked out on the Wednesday at 5 p.m., the milk for the next 24 hours being taken for the tests. Mr. Thomas W. Palmer, the Hon. Secretary of the British Goat Society, was present and kindly superintended the whole of the work.

Samples of the morning and evening milks were taken and analysed by the officials of the Armstrong College.

TABLE VI.—MILK-YIELD CLASSES FOR GOATS AT NEWCASTLE-ON-TYNE, 1923.

No. in Catalogue	Exhibitor	Name of goat	Breed	Date of birth	Date of last kid	No. of days in milk	Milk yield			Percentage of solids not fat			Points					Awards and Remarks		
							Mean	Total	Moys.	Mean	Moys.	Mean	Milk	Solids not fat	Latent heat	Deduction	Total			
							Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.	Lbs. oz.		
1888	Chas. 247.	Welfare of Weston	British Saanen	Jan. 20, 1921	Apr. 4, 1923	59	5 5	4 3	4 3	4 3	4 3	4 3	9 43	9 10	3 05	0 80	—	21-88	1st Prize.	
1889	Mrs. Hines	Beechwood Dolly	Anglo-Nubian	Feb. 14, 1921	Feb. 24, 1923	131	4 14	8 8	6 32	2 18	6 39	8 24	8 37	5 63	2 88	1 50	—	18-83	2nd Prize.	
1895	Mrs. Fosse	Sadberge Pochard	Anglo-Nubian	Feb. 27, 1921	May 9, 1923	37	3 14	2 14	6 13	5 1	6 52	7 75	6 98	2 40	0 20	—	18-42	3rd Prize.		
1897	Chas. 248.	Riding Cherry	Toggenburg	Mar. 9, 1919	June 8, 1923	27	6 8	4 10	11 2	4 2	5 5	8 50	8 47	11 10	10 54	8 75	—	25-44	2nd Prize and Reserve for Dis- card Cup.	
1899	Mrs. Straker	Leasen Hachoe	Toggenburg	Feb. 15, 1919	Apr. 3, 1923	59	3 12	2 14	6 10	3 5	3 6	8 97	9 88	4 70	2 55	0 50	—	14-47		
1890	Mrs. Vahawright	Billywalter Sarah	Toggenburg	Apr. 11, 1919	Apr. 26, 1923	67	6 12	4 12	11 5	3 0	3 2	8 47	8 13	11 50	7 10	3 62	0 40	—	22-82	C.
1891	Mrs. Chamberlain	Wentons of Weston	British Alpine	Jan. 20, 1921	Apr. 18, 1923	78	4 2	3 8	7 10	3 1	5 0	9 34	9 73	7 62	6 06	2 74	0 50	—	17-92	
1898	Miss Booth	Frida	Saanen	Imported 1923	Imported 1923	109	3 12	2 10	6 8	2 8	1 96	8 76	8 47	6 37	3 68	2 19	1 10	—	15-94	
1899	Mrs. Hines	Grietze	Saanen	Mar. 10, 1923	Mar. 10, 1923	117	6 5	4 4	10 9	3 8	3 3	8 80	8 72	10 48	7 60	3 73	1 26	—	25-00	H.C.
1844	Mrs. Fosse	Sadberge Wrynock	Anglo-Nubian	Dec. 22, 1919	May 7, 1923	56	3 4	2 4	5 5	3 4	5 6	9 45	9 37	5 50	6 04	2 07	0 30	—	13-91	
1845	Miss Pelly	Thyngdon Angela	Anglo-Nubian	May 6, 1920	May 6, 1923	58	4 1	2 14	6 13	4 8	5 3	9 34	9 34	6 93	6 88	2 40	0 30	—	16-70	Poultry Ob.
1846	Miss Pelly	Thyngdon Annette	Anglo-Nubian	May 6, 1920	May 6, 1923	50	3 8	2 10	5 40	5 2	5 2	9 77	9 34	6 32	5 62	2 34	0 10	—	14-68	
1847	Miss Pelly	Nash Bellona	Anglo-Nubian	May 6, 1920	May 6, 1923	59	3 15	2 11	6 13	4 8	6 1	9 28	9 31	6 91	7 35	2 00	—	—	—	Reserve for Poultry Ob.
1850	Mrs. Richard	Edenbrook Turf	Anglo-Nubian	May 6, 1920	Apr. 13, 1923	77	2 14	1 14	4 12	5 0	5 0	9 62	9 62	4 79	5 08	1 92	0 60	—	16-20	
1852	Miss Chamberlain	Whitful of Weston	Anglo-Nubian	Feb. 9, 1923	Apr. 4, 1923	92	6 1	4 12	10 13	3 7	4 5	9 48	9 22	10 81	8 70	4 05	0 60	—	24-40	3rd Prize.
1853	Miss Henderson	Riding Tulip	Anglo-Nubian	Apr. 26, 1923	Feb. 18, 1923	137	3 12	3 5	6 14	3 3	3 8	9 28	9 92	6 87	4 84	2 50	1 00	—	18-83	
1854	Miss Henderson	Riding Topsy 2nd	Anglo-Nubian	Apr. 19, 1920	Apr. 20, 1923	76	3 8	4 0	9 8	5 5	5 5	8 92	8 97	6 50	5 80	3 40	0 60	—	15-86	
1860	Mrs. Straker	Blancome's Beauty	Anglo-Nubian	Apr. 19, 1920	Apr. 19, 1923	74	4 5	2 13	7 1	4 1	3 0	8 37	8 67	7 00	6 88	2 45	0 60	—	18-97	
1861	Mrs. Straker	Leasen Fiddle	Anglo-Nubian	Apr. 19, 1920	Apr. 19, 1923	65	6 8	4 10	11 2	3 8	4 3	8 44	8 40	11 13	9 10	3 70	0 40	—	24-97	Res. and C.C. for 1st Prize and Dewar Cup.
1862	Mrs. Straker	Leasen Klutone	Anglo-Nubian	Apr. 19, 1920	Apr. 19, 1923	97	6 7	4 6	10 13	4 4	5 0	9 18	9 37	10 04	3 88	0 60	—	28-73		

EXPERIMENTS IN THE DAIRY.

COMMERCIAL VALUE OF CREAM PER PINT CALCULATED FROM WEIGHT OF BUTTER CHURNED.

Although it is generally supposed that cream is of uniform value, the weights of butter churned from creams of the various breeds of cattle show that there is a difference in the money value of such creams.

To illustrate this, 3 pints of cream from certain breeds were set aside and churned into butter. The butters for the purposes of calculation were valued at 2s. per lb., the money value being divided by 3, so giving the value of cream per pint.

TABLE VII.

Breed	Cream	Butter Churned	Value at 2s. per Lb.	Value of Cream per Pint
	Pints.	Lb. oz.	s. d.	s. d.
Red Poll	3	2 1½	4 2½÷3	1 4½
Ayrshire	3	2 3½	4 5½÷3	1 5½
Kerry	3	2 5½	4 8½÷3	1 6½
Dexter	3	2 5½	4 8½÷3	1 6½
Lincoln Red . . .	3	2 6	4 9÷3	1 7
South Devon . . .	3	2 6½	4 9½÷3	1 7½
Guernsey	3	2 6½	4 10½÷3	1 7½
Jersey	3	2 8½	5 0½÷3	1 8½

DIFFERENT METHODS OF CHURNING.

The experiments carried out at Cambridge of adding water at from 75° to 80° F. during the process of churning, were continued in the Dairy at Newcastle.

Plenty of milk being forthcoming this year, it was possible to carry out the two different methods of churning side by side, so that the conditions were similar in every case.

From Table VIII. on p. 275 it will be seen that on the whole more butter was obtained when warm water was added during the churning, and that the colour of the butter so churned was slightly better than where cold breaking water was used. On the other hand, the texture of the butter churned in the usual way was better than where water at 75° F. was used.

It must be remembered that these trials were carried out in summer weather, when the operation of churning is comparatively easy, and the quality of butter at its best. In the winter months, where churning is more difficult, it is suggested that the addition of warm water, when the churn runs light and before the butter breaks, will not only shorten the operation of churning, but will tend to separate the curd from the butter globules, thus increasing the weight of butter obtainable and improving its colour.

TABLE VIII.

Breed	Date	Cream	Temperatures				Butter	Colour	Quality	Temperatures				Butter	Colour	Quality	Differences in Weights in favour of	
			Dairy Fair.	Old Method		Dairy Fair.				Cream in churn Fair.	Butter	Dairy Fair.	New Method					
				in cream Fair.	Added cream Fair.								in churn Fair.				Added cream Fair.	
British Friesian	July 4	1 b. 7	63	54	48	3 3 15	Slightly paler	Better Texture	63	54	75	4 31	Better than old methods	Soft	—	1		
	July 4	7	66	54	48	4 71	Not so clear	Firmer	66	54	75	4 8	Better	Soft	—	1		
	July 4	7	67	54	48	4 82	Clear	Better Texture	67	54	75	4 6	Clearer	Slightly Softer	—	21		
	July 5	7	68	54	48	4 154	Clear	Better Texture	68	54	75	5 0	Clearer	Softer	—	4		
	July 5	7	68	54	48	4 16	Clear	Better Texture	68	54	75	4 15	Not quite so clear	Softer	—	5		
Lincoln Red	July 5	7	72	54	48	4 72	Good	Better Texture	72	54	75	4 12½	Good	Softer	—	13		

CHEESE EXPERIMENTS.

As at the Derby and the Cambridge Shows, experiments in making cheese from the milks of different breeds of cattle were carried out in the Dairy at Newcastle, the type of cheese selected being Wensleydale.

Tables IX and X give all the details connected with the making of the cheeses, which were subsequently sent to the Staffordshire Farm Institute at Penkridge, where they were looked after by Miss E. Noble, the County Dairy Instructress.

During the first three weeks of the ripening period the weather was extremely hot, causing the natural drainage of the cheeses to be too rapid, with the result that they were not so mellow as they should have been had the temperature been normal.

The cheeses have, however, turned out fairly well, and have confirmed the previous experiments in showing that the milks richest in butter fat yield the heaviest weight and the best quality of cheese.

Mr. J. C. Rushton, the Principal of the Farm Institute at Penkridge, and Miss Noble subsequently judged the cheeses and reported as follows :—

The Guernsey and Ayrshire milks have again produced a good quality cheese. The Jersey is not so good this year, entirely due to the fact that the milk on both occasions was too acid when brought to the Working Dairy to produce a normal cheese.

TABLE IX.

Breed	Date	Milk in Galb.	Fat %		Temperature		Time		Nature of Coagulation.	Acidities		General Remarks
			Milk	Whay	Reonet-ing	Reonet-ing	Reonet-ing	Differ-ence		Milk at Drawing	Whoy	
Kerry .	July 2	10	4.4	-3		58	84	a.m. 10.45	11.1	16		
Red Veil .	July 2	10	4.2	-25		58	84	11.0	11.23	23		Normal
Gursey .	July 2	10	4.3	-4		58	84	10.38	10.58	20		Soft
Dexter .	July 3	10	3.6	-2		65	84	12.5	12.18	13		Very good
Lincoln Red	July 3	10	8.35	-25		65	84	11.30	11.52	22		Normal
Jersey .	July 3	10	4.6	-25		65	84	12.38	12.58	20		Soft
Shorthorn .	July 4	10	4.25	-05		63	84	10.20	10.34	14		Very firm
Friesian .	July 4	10	3.75	-2		63	84	10.30	10.48	18		Normal
Ayrshire .	July 4	10	4.5	-4		63	84	10.42	11.0	18		Soft
Friesian .	July 5	10	3.2	-1		63	85	10.40	10.51	11		Rather soft
Shorthorn .	July 5	10	3.9	-2		68	84	10.34	10.46	12		Rather soft
Jersey .	July 5	10	Sour	—		68	84	10.50	11.7	17		Acid

Brennet used—1 drm. to 4 gallons milk.
Starter used— $\frac{1}{4}$ oz. to 10 gallons milk.
Temperature of scald—86° F.

TABLE X.—PARTICULARS OF YIELD OF CHEESE FROM THE MILK OF THE VARIOUS BREEDS.

Breed	Date	Quantity Milk	Fat Percentage		Weight				Remarks
			Milk	Whey	Salt	Curd	Cheese from Press	Cheese from Ripe	
Kerry	July 2	Galls. 10	4.4	.3	0 $\frac{1}{2}$ 3 $\frac{1}{2}$	Lb. oz. 14 9	Lb. oz. 11 9	Lb. oz. 9 10	Quality fair. Flavour fair.
Bed Poll	2	10	4.2	.25	4	16 12	13 6 $\frac{1}{2}$	12 12	Quality poor. Flavour tainted.
Burnsey	2	10	4.8	.4	4 $\frac{1}{2}$	13 0	15 3 $\frac{1}{2}$	11 4	Quality very good. Flavour good.
Dexter	3	10	3.6	.2	4	17 0	11 15	8 8	Quality fair. Flavour slightly bitter
Lincoln Red . .	3	10	3.35	.25	3 $\frac{1}{2}$	14 0	10 3	7 12	Quality fair. Flavour fair.
Jersey	3	10	4.6	.25	4 $\frac{1}{2}$	18 8	13 2 $\frac{1}{2}$	10 0	Quality good. Flavour good. Too acid.
Shorthorn	4	10	4.25	.05	4	16 0	11 15 $\frac{1}{2}$	8 15	Quality good. Flavour good.
Friesian	4	10	3.75	.2	4	15 12	12 12 $\frac{1}{2}$	8 4	Quality good. Flavour slightly tainted.
Ayrshire	4	10	4.5	.4	4	16 4	12 12	9 0	Quality very good. Flavour good.
Friesian	5	10	3.2	.1	4	16 4	11 0	7 10	Quality fair. Flavour fair.
Shorthorn	5	10	3.9	.2	4	15 0	11 7	8 14	Quality good. Flavour good.
Jersey	5	10	Sour	—	4 $\frac{1}{2}$	17 8	12 12 $\frac{1}{2}$	9 15	Quality good. Flavour fair. Too acid.

As in previous years, the manufacture of scalded cream, cream and soft cheeses, and cheese mixture was carried out throughout the week. To this must be added the milking and butter test trials—trials which give the staff of the Dairy a large amount of work.

To all of the workers, to the Assistant Stewards, to Mr. Hasted and to Messrs. Hammond and Craufurd, I tender my most sincere thanks.

ERNEST MATHEWS.

Little Shardeloes,
Amersham, Bucks.

AGRICULTURAL EDUCATION EXHIBIT, NEWCASTLE-ON-TYNE, 1923.

On the whole, the quality of the Exhibit at Newcastle-on-Tyne was lower than that of Cambridge although it was far in advance of some previous exhibits. The difference was not entirely due to the range of materials which were available for exhibition, although Newcastle naturally had somewhat less command of materials than Cambridge. It was due chiefly to overcrowding of space. The pavilion was too small for the size of the whole exhibit and space was not always allocated in relation to the importance or interest of the various parts of it. The space given to the Meteorological Office, though doubtless required for their materials, was somewhat out of proportion to the intrinsic interest of their exhibit to the farming community, to whom the whole of the Education Exhibit should primarily appeal. And as the stand of the Agricultural Education Association is mainly for the purpose of distributing literature, the suggestion may be offered that its space might have been curtailed without any restriction of the usefulness of this stand. The Agricultural Education Association might consider the possibility of supplying a tall, narrow, sloping stand fitted with pockets, in which literature could be placed in such a way as would show the titles of pamphlets and the institutions which supply them. In windy weather it would obviate the necessity for use of makeshift weights which are sometimes used to keep the papers under control. Such a stand would not be unduly expensive and might very well be transferred from show to show

wherever it might be required. With regard to the Meteorological Office, if the total amount of space in the pavilion is to be limited to that available at Newcastle the allotment to meteorology seems out of proportion to the importance of its position in agricultural research and education or to the comparative interest and value of the exhibit. This is not to decry the value of the meteorological exhibits, and were a greater total space available even their extension might be welcomed. Under the circumstances existing at recent shows, however, the space allotted has to say the least, been on a very liberal scale.

But whatever the whole of the Education Exhibit lacked in qualities of display, mainly due to restriction in space, it lacked nothing in explanation or in the interest which may be created by personal introduction to the subjects which the varied exhibits were intended to illustrate. Professor Gilchrist himself spent a large amount of time in the pavilion, and members of his staff were assiduous both in their attendance and in attention to visitors. The very able and interesting explanatory work which was done at Cambridge in 1922 was quite equalled by that done at Newcastle in 1923. The only matter of regret was that during the more popular times many people could not get near enough to hear explanations, and even those who could did so with some discomfort. Under such conditions the educational value of the exhibits is apt to be curtailed. It was, however, pleasant to notice that some of the crowding was due to the high regard in which both Professor Gilchrist and members of his staff are held by the agriculturists of their area. It is a pleasant thought that research workers, teachers and advisors in agriculture, can establish intimate personal relations with the ordinary members of the community which they serve, and not the least value of the Education Exhibit in areas visited by the "Royal" is that it provides an opportunity for the renewal of these relationships. Even the missionary work of the Exhibit is assisted by such renewals, for the farmer who sees his neighbour studying exhibits with the assistance of an attendant is encouraged thereby to make his own examination less cursory than it might be under less friendly circumstances.

The friendly relations between agriculture and education in the North-Eastern Counties was illustrated not only by the interest of farmers in the exhibit and work of Armstrong College, but more strikingly, perhaps, by the small separate exhibit of the *North Eastern Secondary School*, of Barnard Castle. This was situated between the pavilion containing the exhibits from the elementary schools of Northumberland and Cumberland and the Agricultural Education pavilion, and it was easily

the most attractive, from the exhibition point of view, in the whole block. And for those who were interested both in agriculture and education its register of over two hundred practising farmers who were formerly members of the school, together with the map showing geographical distribution, was not only interesting but cheering. The work of this school, as illustrated by its exhibit, covered some aspects of botany, geology, mendelian breeding, and handicrafts. The whole aspect of the exhibit was a delight to the eye, and better still, every item would bear minute examination. It is, indeed, safe to say that not for many years has the Education Section of the "Royal" contained such a carefully selected, well staged exhibit. It is difficult to single out items for special praise but in a long course of visits to exhibitions it would be difficult to find a more interesting, well prepared and perfectly shown collection of wild flowers than that collected for this occasion by the Secondary School of Barnard Castle.

To pass from this exhibit to the pavilion containing the exhibits from the elementary schools meant inevitable disappointment. Here was a huge collection of very interesting items jumbled together willy-nilly. Such an exhibition would drive a showman or a shop-window dresser into a frenzy. And yet the art of staging such an exhibit is essentially that of the window-dresser, with the exception that the exhibitor has to be more careful of the flaws in his wares because he has not the protection of the intervening glass. It is doubtless difficult for those responsible for staging such an exhibit to arrive at any method of classifying items which will give satisfaction to all the interested parties. Each school likes all the items of its exhibits to be collected in one group, where its name can be displayed at large. But when the items from a school are of miscellaneous character this leads to a jumble of interesting particulars without any unifying characteristics. And when the items are not properly dusted after unpacking the whole is apt to remind a visitor of a curio-shop in a back street. In reality the only interest to be considered in an exhibition of this kind is that of the visitors. Each school can protect its individual interest by an artistic attachment of its name to each item of its exhibit. And the only principle of classification worth considering is one according to the nature of the items. If this had been the principle adopted at Newcastle there were many items that would have been returned to their packing-cases, to the advantage of the exhibit as a whole. Amongst several examples of one item scattered over the staging would be found good, bad and indifferent. In some cases placing the bad sample close to the good would have led to the immediate discarding of the former. The truth is that the teachers of some elementary

schools have not yet learned that their pride in the mere fact that they teach handicrafts or rural science or lore must not be allowed to prevent their selective faculties from coming into play. Until teachers can change, or until persons responsible for the general staging of exhibits from elementary schools are enabled to use their discretion more drastically, the exhibits must suffer from the exhibition point of view. It is, however, sincerely to be hoped that this work of the schools will not suffer, in consequence, from any lack of public interest. From an agricultural point of view one item in this exhibit was very bad. A model dairy, supposed to be made to scale, was shown, but by the measurements of the model no milker could tip the milk into the cooler without use of steps—a ladder would almost be required—and no steps were shown. The exhibits from the elementary schools are always a welcome feature of the Education area of the "Royal," and the teachers and local authorities who are energetic enough to provide them should be encouraged in every possible way, but for their own sakes and that of their work they should make the best possible use of the facilities available.

The exhibits of *Armstrong College* covered items dealing with Crop Husbandry, Animal Husbandry, and Management of Grass Land. The exhibits from *Newton Rigg* dealt with Dairying and Horticulture. But *Armstrong College* added a special exhibit of prints, paintings and photographs illustrating the development of sheep breeding in Northumberland. This was organised by Alderman Parlour and Professor Gilchrist. On the whole, this exhibit was not so good as a similar one illustrating the development of shorthorn cattle which was shown at Darlington some years before. It is doubtful whether some theories of the development of breeds of sheep which were indicated in the illustrations, and in the explanations, would bear historical examination. But at the same time it could be wished that every Agricultural College had such collections of pictorial illustrations of the development of cattle and sheep as those staged by *Armstrong College* at Darlington and Newcastle. The College had also arranged for an exhibit of hides, showing effects of attack by warble fly, from the Newcastle Hides Inspection Society. These could scarcely be regarded as representative samples, and they tended to induce farmers who inspected them to doubting and jocular remarks about the use of a punch. There were also some charts prepared by the City Veterinary Officer, Newcastle, showing the number of carcasses of animals condemned within the city during recent years. One showing carcasses of beef condemned over a series of years was useless because it failed to show total numbers slaughtered, but another, for 1922, gave these figures :

CARCASSES OF MEAT CONDEMNED, NEWCASTLE-ON-TYNE, 1922.

	Total Slaughtered.	Unit for Consumption.		Tuberculous.	
		Whole Carcase.	Parts or Organs.	Whole Carcase.	Parts or Organs.
Cows	728	38	43	39	43
Heifers	9,083	24	29	21	19
Bulls	537	3	1	3	1
Bullocks	5,936	20	27	16	14
Total	16,284	85	100	79	77
Calves	2,847	31	—	—	—
Pigs	30,281	32	—	—	—

If figures of this character could be collected from all large cities it would be possible to get a definite idea of the risk of condemnation of fat cattle which is undertaken by farmers, dealers and butchers, and to assess the premiums which would be required to cover such risks. Newcastle is to be congratulated on having the figures available, but it was a pity that the chart dealing with a series of years gave only the figures for condemned carcasses without any measure of the proportion of the condemned to the total.

All the exhibits dealing with the management of grass land were very good, and the sample turves were very effective. In this connection a chart showing varying costs of the application of phosphates in different forms elicited a great deal of interest from farmers not only of the North-Eastern Counties but from all over England. Even a group of East Anglian farmers, some of whom are well known, were seen studying it in detail. Exhibits dealing with insect pests were not quite as good as they can be made, but those dealing with plant diseases were a better example. Incidentally, an exhibit showing leaf-curl, wart disease, and mosaic amongst potatoes, together with healthy plants, puzzled many people by reason that the plants most healthy in appearance were those said to be suffering from wart disease.

The *National Institute for Research in Dairying, Reading*, had a varied exhibit. A chart showing yearly yield of milk of cows in two successive periods was interesting and useful, as were two others dealing respectively with milk yield of cows calving in different months of the year, and with the progeny records of bulls. But a chart purporting to show that heavy milk yields mean low costs of food was a little too theoretical and simple to be really accurate. If the theory were tested

under actual conditions the results would probably be much different from those shown. Again, figures showing the varying proportions of items in cost of production of milk during the summer and winter periods was not quite a good example, for in relation to what is known of normal conditions labour costs, especially in winter, were low, and depreciation of cows was high, especially during the summer period. The figures were as follows :—

ANALYSIS OF COST OF MILK. (Per cent.)		
	Winter.	Summer.
Cost of Food	72.0	53.0
" Labour	11.7	14.2
Proportion of Rent and Rates	1.4	2.1
Depreciation—Cows	10.0	21.4
Plant	0.6	1.0
Repairs and Miscellaneous	2.3	5.0
Delivery	2.0	3.3
	100.0	100.0

The establishment of standards of this character will assist farmers to measure the efficiency of their own management, but the standards require to be sufficiently broad-based to provide a general test. Some of the charts of the Institute are now getting a little time-worn, and might be renewed and improved upon.

Of the *Metecrological Office* exhibit nothing need be said except that some of the simplest and best charts exhibited, as those dealing with first and last frosts, ought to be published in a cheap form in which they would be available for all students of agriculture; and some others have so little relation to farming that their display in the Agricultural Education Exhibit is scarcely justifiable.

Altogether, the Education Section at Newcastle-on-Tyne brought together a very varied, interesting and useful collection of exhibits. All those who were responsible for collection and staging and for the explanation of exhibits are to be thanked for their work. They are also to be congratulated on the success which was achieved in spite of restrictions of space. For this latter they were not wholly responsible, but future exhibitors would do well to consider a policy of rigid selection of items to be exhibited whenever space is insufficient for adequate display of all the materials which are available.

The exhibit was again under the charge of Mr. Wilfred H. Parker, Director of the National Institute of Agricultural Botany at Cambridge.

THE FORESTRY EXHIBITION AT THE NEWCASTLE SHOW, 1923.

THE district to which the "Royal" was allocated in 1923 is more occupied in coal-mining than timber production, and though timber is indispensable to the miner, it happens that the growing tree most decidedly objects to the miners' operations in its vicinity. The north-easterly counties of Northumberland and Durham are swept by cold winds, and are districts of very low rainfall, and in consequence they cannot produce timber like more favoured portions of England.

This fact was, no doubt, the main cause for the reduced entries in this Section—73 in the Competitive Class and 45 in the Non-competitive Section.

The steward was Mr. C. Coltman-Rogers, with Messrs. Edward Davidson and Wm. Dawson as assistant stewards, and they had made admirable arrangements with the material forwarded; the exhibits being staged in the back-to-back bays down the centre of the large building, while the planks and other heavy material were set along each side of the building, with gates and fencing and the model pine plantation in the open air. Right and left exit doors were arranged at the end of the building. This arrangement spread the crowds into four separate lines, and was a very good method of obviating the jamming so much in evidence at these places.

Members of the Royal English Arboricultural Society and the Forestry Commission were in attendance each day to answer questions and to explain any phase of forestry work—and they had some very busy periods. There is decidedly now a much greater appreciation of the duty of replacing our vanished woodlands, and this is as it should be—for in due time our country will reap the benefit following an extensive increase of the area under forest.

Before proceeding to enumerate the awards gained in each class, it is but just to specialize those entries which bore the stamp of an earnest endeavour to increase the utility of the native product, either directly from the raw material or indirectly through an educative channel. Class 6 was for panels, boards, home-made furniture, or any other article grown and manufactured on the exhibitor's property.

An outstanding collection of 30 articles was staged by Colonel Leather, of Middleton Hall, Belford, in this class. There was timber cut to size for the complete cart, wheelbarrow, and draught gears for horses, with made-up troughs for sheep, pigs, and young cattle, shingles for roof and wall coverings, field

troughs, and gate fastenings. The timber used was of fine, hard quality in oak and elm, with ash for shafts, and Scots pine, spruce, and larch fir for the troughs and weather boards, all grown on the estate.

Sales of stock sizes are effected by issuing a sheet price list at different periods, and the rural cartwright and builder may obtain seasoned materials at hand without having to go to the city for supplies.

This is a method of disposal which should surely commend itself to every owner of woodland, and the rural industries would begin to recover were it more practised throughout the country. A silver medal was awarded to this excellent exhibit.

In the section for non-competitive exhibits, a silver medal was awarded to the Earl of Yarborough, Brocklesby Park, for a most instructive exhibit showing the penetration of creosote into 27 different species of timber, which has been dried, barked, and steeped under pressure, afterwards being sawn right down the middle to expose the depth of wood saturated by the creosote. From an economic standpoint, this was one of the most valuable exhibits in the show. Side by side with the sample lengths of creosoting were specimens of acacia posts after 50 years' service in ground, and six creosoted posts which had been in the soil from 15 to 27 years were also shown in good state of preservation.

His Grace the Duke of Northumberland had an admirable exhibit outside the tent, comprising a square of ground laid out in four different periods of a Scots pine wood's age. The exhibit was a wonderfully good representation indeed, and showed the surface vegetation of ling and bilberry characteristic of very poor soils on which the pine is usually the only tree to succeed. Stage 1 represented the area after four years' grazing by sheep and now pit planted with 2-year-old Scots pine at 4 ft. apart. Stage 2 showed the crop of young poles growing at 11 years from being planted, and were up to 11 ft. in height. Stage 3 gave the crop at 45 years old felled for pitwood, with the density and volume for one acre. Stage 4 was the final felling and conversion at 70 to 80 years, the boards and planks being shown from these aged trees. The exhibit was most attractive, and deservedly gained the silver medal.

The exhibit staged by the Hancock Museum, Newcastle-on-Tyne, was of great scientific and practical value to foresters. Under four separate series the useful as well as the harmful pests of the insect and animal world were to be seen in very lifelike positions. The various injurious effects caused by the pests were staged beside the cause of them, often in the act of doing the damage.

Very good specimens of injuries caused to plants and trees

by fungi were also on view, and being in series, the effects could be traced throughout each cycle with great interest. A great deal of care was bestowed on the proper mounting of each specimen, and altogether the educative character of the objects in this bay well deserved the silver medal awarded.

The Forestry Commission, per Captain Hopkinson, Divisional Officer from their centre at Chopwell Woods, staged two bays showing the more practical part of forest work. A coloured map with the various sections under treatment was shown, from which it was found that the total area in hand is 870 acres. There is a tree nursery of $2\frac{1}{2}$ acres, and the regular staff numbers ten to twelve hands under the forester, Mr. Anderson.

The development from seed to transplant was shown in boxes, with full particulars of quantity of seed sown and number of plants produced. Sixty hand specimens of British-grown woods were shown, and commercial timber for pit bogies and tubs, brake and shunting poles, paving blocks and pit chocks, brush and chair wood, was displayed. Specimens of damage by insect life and various tree seeds were also staged. This centre carries out the instruction of young men in forestry science, and is admirably equipped in every way.

The Royal English Arboricultural Society staged two bays. Mr. Davidson, the genial secretary, was in charge, with various foresters of the Society as assistants.

The exhibit which attracted most patronage was undoubtedly the model plantation which had been arranged as typical of sporting and amenity. This was contained in a case 5 ft. by 3 ft., set in the centre of bay, level with the side tabling, and the surface had been covered with herbage showing hill and valley conditions admirably, with a stream flowing down the winding valley into a miniature lake on which floated wildfowl of various species. The plants were growing in open order, with masses of spruce in the damp hollows and oak and larch on the bracken-covered slopes. The sporting element was provided by miniature models of pheasant, duck, and wood-pigeon, while ground game was numerous, with deer on the hill-side. The sportsman with setter and gun was to be seen also at several points.

On the side benches the Society showed products of silviculture and arboriculture, one fine example being the root system of a large riverside tree which had been carefully taken up and was formed into a comfortable arm-chair. Photographs and slides of the scenes visited by the Society on its annual excursions were numerous and there were the first prize essays from the newly established Rural Schools Tree Essay Competition.

The second bay contained a model of silvicultural plantation and boxes with plants inserted in soil carrying the vegetation

upon which the type of tree in compartment was known to succeed. Pine weevils at work on Scots were on the side table, and showed a good object-lesson on the danger to be faced in replanting pine-covered ground. Messrs. Wear supplied two very fine boards of sycamore and burr oak, and the Society, through its members, furnished some remarkably fine boards of oak, elm, Wellingtonia, Douglas, yew, and cedar. Collections of witches' brooms and tree seeds, some paving blocks sent by the British Wood Company, and a leaflet giving the history of the Society and the objects it endeavoured to stimulate, which was distributed to all who appeared interested, completed the stand, which was awarded a silver medal.

The Liverpool Corporation exhibited gates, hurdles, and rustic huts made up from small thinnings of larch and Douglas fir, grown on their water catchment area at Lake Vyrnwy, in Wales. The economic use of this small material is a difficult one, and the management deserve great commendation for their enterprise, as it enables the woodmen to get work inside while storms and winter season prevents outdoor operations. A circular issued by the agents, Messrs. Addie & Son, of Shrewsbury, showed the prices to be very reasonable.

Messrs. Ben Reid & Co., of Aberdeen, exhibited a splendid collection of forestry tools, priced for sale, with photographs of their nurseries, showing all the operations of plant culture. This firm also gave practical demonstrations at intervals during the day with their patent transplanting boards. A silver medal was awarded to the firm for this excellent exhibit.

The "Wade" petrol cross-cutting saw, exhibited by Messrs. Christy & Penny, Ltd., London, also gave practical demonstrations at intervals with their machine, cutting slices from the end of a large elm log with great rapidity and ease.

Among other exhibits the firm of Messrs. Calders, Ltd., Newcastle, showed railway sleepers, new and ready for use, and old ones which had been in use on local railways for a number of years, under varying conditions. A very instructive exhibit. Colonel E. R. Pratt, of Ryston Hall, Norfolk, exhibited a collection of up-to-date hybrid poplars—some of these are giving astonishing results in growth.

Mr. John Patten, jun., Durham, sent twelve remarkably well executed drawings in water-colours of flowers and fruit of British trees, and Messrs. Trewhella Bros., of Birmingham, displayed photographs of their wonderful root-lifting appliances.

The special medal offered by the Royal Agricultural Society for the best general collection of exhibits in competitive and non-competitive classes was awarded to Colonel Leather, with the Earl of Yarborough as reserve.

In the Competitive classes the entries were not large. In

Class 1, for specimens of oak, elm, ash, and beech, Major Lord Barnard, M.C., showed four very good planks, gaining the silver medal by three marks only on an eighty total. The bronze medal was awarded to the Trustees of Viscount Ridley, whose exhibit was also a very good one.

Class 2, for specimens of larch, Scots, and spruce, produced the same result, the silver medal being awarded to Lord Barnard, whose Scots pine plank was a fine piece of timber. The planks shown by Viscount Ridley were of good character, but somewhat narrower. They well deserved the bronze medal awarded.

Class 3, for any other sort of broad-leaved timber, only produced one exhibit. A bronze medal was awarded to Colonel Leather for his exhibit of Spanish chestnut, wild cherry, hornbeam, and sycamore.

Class 4, for any other sort of coniferous timber. The same exhibitor was awarded a silver medal for his excellent collection, comprising specimen boards of Douglas fir, Thuja, Wellingtonia, silver fir, *Abies grandis*, and *Sequoia sempervirens*.

In *Class 5* the Earl of Yarborough had a splendid collection of native boards, 106 different species being shown, with labels denoting their name affixed thereto. This exhibit was awarded a silver medal at the previous year's show, and so a highly commended card could only be awarded this year.

Class 6. Colonel Leather deservedly won the silver medal with his collection of articles made for everyday use from native woods grown and made on his estate. It is of very much more importance to the nation to have its resources utilized in the way this exhibit manifested than to see a few examples of finely grown boards, many of which could not be duplicated on the exhibitor's estate. The exhibit from Middleton Hall was a refreshing improvement on the usual style of exhibits in this class, and showed a commendable endeavour to develop rural industry.

EXHIBITS OF GATES.

Various conditions have to be observed in the competition for gates, one of which is that the materials must be price *at current merchants' prices*, and not at bare estate cost. This is a reasonable condition, but it lacks in one respect, namely, that the exhibitor ought to be held responsible to supply the materials at the price put down, unless he states in his entry that he does not undertake to do so. To take an example of the ridiculous prices which are occasionally met with, the lowest figure for the full set of gate wood in excellent selected oak was only 5s. 2d. The highest price for same materials was 15s., and the timber all grown on the north-east coast of Northumberland not 40 miles apart! In one case the 3 cub. ft.

of oak in the gate is priced at 1s. 8½d. per cub. ft., and the other is 5s. A fair price for this class of oak sawn into small sizes for gate wood would be about 4s. per cub. ft.

In the judging of the gates, 20 marks were awarded to each of five headings, *i.e.*, (1) general utility, (2) price, (3) construction, (4) adjustment, (5) ease and security in fastening, it being possible to secure a maximum of 100 marks.

In *Class 7*, Colonel Leather secured the silver medal with 90 marks, and the Dean and Chapter of Durham was placed second for the bronze medal with 83 marks.

The other gate entered in this class was excellently made of splendid oak, but unfortunately lost marks seriously under the headings of (2), (4), and (5). The class is for an oak field gate for farm use, and economy with efficiency for *practical purposes* are mentioned as the chief points to be considered in judging. Elaborate dressing to tops of head and hartree is not necessary, and it ought to be possible to secure a gate with one fastener, while the necessity for adjustment had been quite overlooked in one exhibit. These are some of the points which are of great importance in the use of an ordinary field gate.

Class 8 was for a field gate of any other home-grown wood, and five gates were exhibited. The silver medal was awarded to Colonel Leather for a good class of larch gate. Major Lord Barnard secured the bronze medal with a rather high-priced gate and posts. In this class the marks varied from 90 to 66. The gate made of Thuja wood was a novelty, but the wood was coarse and knotty; a large knot in the top bar very seriously reduced the strength of the gate.

Class 9.—Hunting wickets, self-closing. This is a very interesting class, and ingenious devices are always found to effect the closing of the wicket, while the basic condition in a hunting gate is the possibility of opening it while mounted. The arrangement shown by Major Lord Barnard gained the silver medal with 98 marks—two marks being deducted under the heading of price, which was put down at the high figure of £2 4s. Comparing prices of timber in this class, we find the lowest for wicket and posts to be 10s. 8d., and the highest price to be for the same material £1 10s. ! One exhibit showed a good idea for self-closing, which consisted of a chain fixed to the hanging post and wound once round the hartree at about the level of bottom hinge. The pins were extended in crooks to about 10 in. long, and on opening the gate the chain was pulled into shorter position and the gate rose on the lengthened pins automatically, with the result that on the gate being released, the wicket dropped again and closed.

Class 10, for tree guards only, drew one entry, for which no award was made.

Class 11, for fencing, home-grown and made in Great Britain, secured two entries only. Major Lord Barnard was highly commended for his exhibit.

Class 12, for fencing of foreign timber, creosoted, open to the trade, brought some very good exhibits. Messrs. Armstrong, Addison & Co., Sunderland, showed nine different fences, ranging in price from 1s. 6½d. to 6s. 9d. per yard for the latter, being a close paling fence. One example shown by this firm was of their 1A fence after 54 years' use in all weathers outside, and still in good order. The exhibit well deserved the highly commended card awarded. Messrs. English Bros., of Wisbech, were commended for the exhibit consisting of eight samples of strong creosoted fencing ranging in price from 10½d. to 4s. 3d. per lineal yard.

W. H. BENNETT.

Brackenburgh Tower Estate,
Carlisle.

REPORT OF THE JUDGES ON THE PLANTATIONS AND ESTATE NURSERIES COMPETITIONS, 1923.

THE competitions were confined this year to the counties of Kent, Surrey and Sussex. There were 35 entries in the Plantations competition and 6 entries in the Estate Nurseries competition, representing eleven estates. The majority of the entries were forthcoming from Sussex. Kent contributed 6 out of a total of 41, and Sussex the balance, whilst Surrey was very disappointing in offering none.

The competition was extended to embrace two further classes and for the first time Coppice and Coppice with Standards are given their rightful place in the list of woodland types.

The South-Eastern Counties present a variety of soils derived from recent geological strata, but generally the woodlands fall into three main classes, namely, the coniferous areas of the upper and lower greensand, the beech areas of the chalk, and the hardwood areas of the Weald clay. The rate of growth of trees varies considerably, but, with an equable climate and a rainfall of up to 40 in. per annum, some parts are amongst the most rapid timber-producing areas of the country.

Class 1. Coppice Area.—For the best-managed area of chestnut or ash coppice. Four entries. All the entries were of chestnut coppice.

In this class the Silver Medal was awarded to Lord Leconfield, Petworth, Sussex, for four cants at Brinksole. The four cants were of two, three, four and seven years' growth and were respectively approximately 2, 3, $1\frac{1}{2}$ and 4 acres in extent. Records give details of cuttings made since the year 1872 on a general rotation of about six or seven years, and it is interesting to note that whereas £20 per acre was the selling price of seven-year-old coppice about 1878, the value has steadily dwindled to £5 per acre for five and six-year-old coppice since the war. The coppice is standing on sloping ground on the lower greensand and the growth made is very rapid, the average height of the two-year-old crop being about 10 ft. with a first year's growth of up to 7 ft., whilst the seven-year-old crop reaches an average of 28 ft. and up to $2\frac{1}{2}$ in. in diameter with a first year's growth of up to 8 ft. The crop is very uniform, is practically pure chestnut, the stocking is very good with a between-stool distance varying from 3-4 ft. in the different cants, and the cutting throughout is good, low and even; Brinksole Hangar cant in particular being quite ideal in every respect. The method of re-stocking adopted here is to plant large chestnut plants and cut over with the rest of the crop at the nearest felling.

The Bronze Medal was awarded to Lieut.-Col. G. L. Courthope, M.C., M.P., Whiligh, Sussex, for a number of contiguous cants of chestnut in Long Wood. The normal rotation is eleven years and the cants represented all age classes. The soil is clay and the growth is not so rapid as in the former case, in one cant of twelve years' growth the height reached up to 28 ft., but the diameter was greater, largely due to the fact that the custom in these parts is to grow the chestnut at a distance of about 5 ft. apart. Throughout the cants there were a few oak standards and a small percentage of hazel coppice. The stocking was good and the cutting was well done. The coppice is cut either by the estate staff or sold privately to local farmers for hop poles and fencing at prices up to £15 per acre standing.

Class 2.—The best and most systematically managed wood of coppice with standards. It was hoped that this class would attract a number of entries, whereas there were only two and they were really weak in many respects.

Col. Courthope was awarded the Silver Medal for Great Hook Wood, an area of $19\frac{1}{2}$ acres standing upon clay overlying Hastings rock. The coppice was of six ages up to eleven years with some twenty-two years of age, chestnut was the predominating species with alder in wet places, but there was a fair quantity of other species such as ash, hazel, with some birch in places. The standards were mostly of oak up to 160 years old with a

few ash and chestnut. The older age classes are well represented, but there are considerable gaps amongst the youngest oak age classes, which are only partly made up by the presence of young ash and chestnut standards. As no oak is ever planted at Whiligh, it is suggested that the lack of young oak is due to the absence of acorn crops at the felling periods, which, in turn, is largely attributed to a succession of bad attacks of the oak leaf roller moth (*Tortrix viridana*) for some years. The ash and chestnut are healthy and fairly vigorous, but the growth of the oak is poor, the best standards having a total height of about 60 ft. and a quarter girth of 18 in. Owing to the situation the value of the underwood is less than on other parts of the estate, hence it is intended to store as much of the ash as possible, together with some chestnut, and grow on with a heavy stocking of standards of 180 to 200 per acre in the hope that they will suppress the underwood in twenty years, when it is proposed finally to convert into conifers under ash standards, but it is doubtful if this will be accomplished so soon without a still heavier stock of standards.

The Bronze Medal was awarded to the Marquis Camden, Bayham Abbey, Lamberhurst, Sussex, for Rowland Wood. This wood was 13 acres in extent, in which the underwood consisted of one year's growth of mostly chestnut with some ash and hazel, and an overwood principally of oak with a few ash and larch up to 100 years of age, all of moderate growth. The stocking and distribution are incomplete, and there are some gaps in the gradation of age classes.

In Class 3, hardwoods as final crop, Stage A, there were four entries. A Silver Medal was awarded to Lord Leconfield for Burchetts Wood, 15 acres in extent and fourteen years of age. The crop consists of natural oak over underwood mainly composed of hazel. The coppice was last felled in 1920, and at the same time a thinning was made in the oak with a view to securing an even distribution at about 6 ft. apart. There are but few gaps in the oak where seedlings failed to appear, and the trees are all pruned up to a height of about 8 to 10 ft. Considering the denseness of the crop of oak in many parts of the area at the time of the last coppice felling and the heavy thinning of oak, it is surprising how few trees have been bent by winds. The average height of the oak is now 13-14 ft., whilst the best trees reach as much as 22 ft. This wood appears to have good prospects if the oak is scarcely touched at the next coppice felling.

Col. Courthope was awarded the Bronze Medal for the 7 acres Brickyard Plantation, which consists of a number of blocks containing chestnut fourteen years old, ash overwood about forty years old, with ash underwood five years old and Douglas fir underplanting four years of age. This wood is particularly

interesting as representing an experimental conversion of chestnut coppice; the chestnut was planted about 1899 and cut in 1909, one block was allowed to grow without interference, and has now naturally cleaned itself to but little over one thriving shoot per stool, but the other part was thinned out to one shoot per stool three years later. The latter block now carries double the volume of the former, the poles are straighter and fully 6 ft. higher.

Class 4.—Hardwoods as final crop, Stage B, produced only one entry. This consisted of a crop of natural oak in a plantation of ash, which has been coppiced and is gradually being suppressed by the oak canopy. The wood is about 6 acres and the oak are about fifty years of age. The growth of the oak is exceptionally good, giving fine, clean, straight poles. It is intended to fill the few existing gaps with *Abies Grandis* or *Tsuga Albertiana*, remove a few of the oak standards and underplant the whole. For this wood an award of a Silver Medal was made to Col. Courthope.

Class 5. Stage A, Conifers.—In this class there were seven entries, and the Silver Medal was awarded to the Marquis Camden for Skents Wood, an 8-acre plantation of mostly conifers now twelve years old. It was originally pit-planted at 3 ft. apart with Scots pine, larch, ash and beech, the hardwoods forming 25 per cent. of the crop in the following fashion: One row of larch and Scots pine and one row of beech, Scots pine, ash and larch. The object was a final crop of larch with a few hardwoods, using the Scots pine as nurses. The condition of the plantation at present is that the ash have disappeared, owing to rabbits getting in during the war period, the beech are suppressed and also very badly rabbit damaged. The Scots pine are mostly suppressed, but in places are co-dominant with the larch which form the main crop. The cost of establishing the crop was £8 10s. per acre, the plants used being 2 year 2 year transplants of 18 in. to 24 in. class. The soil is a clay loam, the ground slightly sloping towards the north, and the average rainfall of the district about 31 in. per annum. The crop is very even, there are practically no gaps, and the soil throughout is devoid of surface vegetation. There now remain about 1,500 trees per acre with an average of about 1 cu. ft. per tree. The height growth is good, and on the higher ground they average 32 ft. in height. As we pass downwards the height improves slightly with a quarter girth of 3½ in. The former crop consisted of seventy-years-old larch with hardwood undergrowth, and it will be seen that the present, which is a second crop, does not appear to suffer on that account, for not only is the crop itself very vigorous, but there is very little canker throughout the whole wood.

The Bronze Medal was awarded to the Executors of the late W. D. James, West Dean Park, Chichester, for a 9-acre plantation of conifers now fourteen years old. The plantation consists of three blocks, the first which forms the majority consists of European larch mixed with about 20 per cent. of Scots pine, 6 per cent. of beech and an occasional Douglas fir. The soil consists of a calcareous loam overlying chalk and the plantation is semi-exposed at an elevation of about 500 ft. above sea-level, sloping gradually to the south. The average size of the larch is 28 ft. with a quarter girth of $2\frac{1}{2}$ in., whilst the best trees have a height of 32 ft. with a quarter girth of $3\frac{1}{2}$ in. and a few up to $4\frac{1}{2}$ in. The Douglas are uneven in size, but the largest are larger than and topping the larch, and run up to 35 ft. in height with $4\frac{1}{2}$ in. quarter girth. The Scots pine have a height slightly less than the average of the crop, and an average quarter girth about equal to the larch. The beech are co-dominant with the rest of the crop. The area is very fully stocked and needs a light thinning. The soil and canopy are good, some of the larch are cankered and some others are infested with honeysuckle. All the trees have been pruned to a height of 5-6 ft.

The second block consists of $\frac{3}{4}$ acre of pure Douglas on slightly higher ground. In this plot the growth is not nearly so good as that made by either the larch or the Douglas in the previous plot. The average height is about 25 ft. and the average quarter girth 2 in. The canopy is dense and the trees are fairly even in size.

The third plot consists of $\frac{1}{4}$ acre in which the European larch has been substituted by Japanese larch. The Japanese have made better growth than any other species, being fully 4 ft. higher than the best larch in the first plot, and $\frac{1}{2}$ in. larger in girth.

Among the other entries may be mentioned a very useful plantation, partly Japanese larch and partly European larch, on the Petworth Estate, and the Warren Wood Larch Plantation of the Earl of Chichester, both of which show good promise.

Class 6. Stage B, Conifers.—In this class there were only two entries, and a Silver Medal was awarded to the Executors of the late W. D. James for $14\frac{1}{2}$ acres of almost pure larch facing east and at an elevation of 550 ft. and planted twenty-six years ago. A few beech were planted with the larch, more beech and ash have come in by natural regeneration. The soil consists of chalk with flints. The crop consists at present of about 50 per cent. larch and 50 per cent. beech and ash. The larch are dominant, the latter species in many cases having suppressed the former. The beech are mostly dominated, but some are co-dominant with the larch and the ash. The average

height of the larch is about 55 ft., whilst the best reach over 60 ft. and the quarter girth averages about $4\frac{1}{2}$ in., whilst the maximum reaches $8\frac{1}{2}$ in. The soil conditions are good with very little ground vegetation, but the ash are now becoming cankered and generally have bad crowns. It is proposed to remove these latter at an early date.

The Bronze Medal was not awarded.

Class 7. Stage A.—Mixed plantation of hardwoods and conifers. There were three entries in this class, and the Silver Medal was awarded to the Earl of Chichester, Stanmer, Lewes, Sussex. The plantation receiving the award was 5 acres in extent, twelve years of age and consisted of a mixture of larch, ash, oak, Scots pine and a few spruce. The soil is a good loam, and the previous crop was coppice with some standards. If at the time of planting some sycamore and ash coppice shoots had not been stored, this would have been a very fine plantation; as it is, it is patchy and is a good example of how little overhead shade larch and oak will stand. The larch and ash have grown well, reaching as much as 30 ft. in height and 5 in. quarter girth. The Scots pine and spruce are of little or no value, but the oak are holding their own very well, and although in many cases they will become suppressed if they are not favourably treated within the next few years, there are many trees well up into the crowns of the other species. The crop is a dense one and we are of the opinion that it needs an early thinning, though this must be steadily carried out as the plantation is exposed to south-west gales.

The Bronze Medal was awarded to the Rt. Hon. James F. Hope, M.P., Herons Ghyll, Uckfield, for 7 acres of thirteen-years-old larch, beech, ash, a few sycamore and Sitka spruce in some of the very wet places. The plantation made a very good growth from the start and the trees now have average diameters as follows: larch, $3\frac{1}{2}$ in.; ash, 3 in.; Sitka spruce, $3\frac{1}{4}$ in.; and beech, $2\frac{1}{4}$ in.

Class 8. Stage B.—Mixed plantation of hardwoods and conifers. In this class there were three entries, and both the Silver and the Bronze Medals were awarded to Major R. Alexander, Swifts Place, Cranbrook. The Hilly Wood Plantation, securing the major award, was 30 acres in extent and consisted of several portions, part of which was in single tree mixture, and the remainder mixed by groups. The soil consisted of a loam overlying the Tunbridge Wells sandstone of the Hastings beds. The area was formerly an old hilly park pasture, and in preparation for planting it was ploughed twice. The plantation is uneven aged, the various blocks having been planted at intervals between the years 1898 and 1910. The oldest portion, now twenty-five years of age, consists of a mixture of

Norway spruce, larch, Scots pine, silver fir, ash and chestnut, which trees have made remarkable growth. The wood had to be heavily thinned for war requirements five years ago, many of the best trees having been cut, as was obvious by the butts, and we were informed that larch up to 72 ft. were then cut down. At that time, when only twenty years old, as much as £100 per acre was realized by the thinnings. The crop remaining therefore does not represent the best of the plantation, although it now contains some very fine trees for their age, and in spite of the heavy thinning there is still a great deal of timber standing on the ground. On the lower part of this section of the plantation the larch measured up to 70 ft. in height with a quarter girth of 12 in., silver fir 75 to 80 ft. high of 12½ in. quarter girth, spruce, Scots pine and chestnut being much of a size with the larch, but the ash varied between 55 and 60 ft. in height. The second section, planted in 1900, consisted partly of some very fine ash, a full plant, mixed with an occasional birch, having a height growth of 55 to 60 ft., and partly of nearly pure larch, also fully stocked and well up to 65 ft. In a slight hollow near by were noticed black Italian poplar of twenty years' age, reaching 70 ft. in height and with a quarter girth varying from 6 to 12½ in.; also a small group of Douglas nineteen years old, where we measured one tree 72 ft. by 11½ in. quarter girth and another 68 ft. by 13 in. quarter girth. Both the poplar and Douglas must have been well sheltered on three sides by the surrounding older plantations. A portion eleven years old consists of beech mixed with a few Douglas in the proportion of 9 to 1. The former species was holding its own well, although on an average it was several feet shorter than the Douglas, which was as much as 35 ft. high. Another section deserving mention is 2½ acres of larch with a few Scots pine planted sixteen years ago. This has been twice thinned, and on the second thinning about 500 trees per acre were removed. There now remains a very level crop of about 1,500 cu. ft. per acre with an average height of 45 ft. and 4½ in. quarter girth, whilst the best reach 48 ft. with 6½ in. quarter girth. This remarkable plantation, which was all planted by the present owner, with the assistance of his present forester, was also awarded the Gold Medal offered by the Royal English Arboricultural Society for the best plantation in the competition.

The Bronze Medal was awarded to a plantation of 20 acres which consisted mainly of birch, alder, chestnut and larch mixed either by trees or in groups, planted at intervals between the years 1900 and 1906. The section in which larch occurred was thinned five years ago and £100 per acre was received for the thinnings. The crop is now rather light, but still carries a considerable volume of timber. The chestnut was planted originally

4 ft. apart in 1903, was cut five years ago, and is now about 25 ft. in height. The remaining section has been treated by thinning the chestnut and some of the birch, so that now it has become a wood of two stories, with the alder and birch in the upper story reaching a height of about 40 ft., with chestnut coppice, which is poor through excess of moisture.

In Class 9, for the best example showing systematic management of an existing woodland area, including the renovation and conversion of an unprofitable wood into a profitable condition, there were three entries, and the Silver Medal was awarded to Viscount Cowdray, Paddockhurst, Sussex. The scheme presented related to 135 acres of old woodland which consisted originally of rough and useless birch about twenty years old on a soil consisting of sand overlying Hastings rock with a northerly slope and a northerly aspect. The method of treatment has been to subdivide the area into four blocks, of which three have already been felled and replanted with conifers. The species used are Douglas fir on ground carrying bracken, Sitka spruce on the lower wet ground, Scots pine on thinner soil, and some Japanese larch. Beech has been mixed throughout, and all the plants were pit-planted. The remaining quarter of the area was cleared this year, when the cordwood was sold for 10s. per cord, which price rather more than paid for the cost of cutting the standing birch and cording it. Some standards have been left for ornament, shooting, or other purposes. The whole area is wired in against rabbits and the total cost for the whole work amounts to £12 per acre. The general scheme is good and, except for a rather high percentage of loss among the big Douglas fir transplants, and the poor growth of the larger Japanese, the young plantations promise well.

The Bronze Medal was awarded to the Rt. Hon. J. F. Hope for 150 acres of plantation varying from one to seventeen years of age. The crop formerly consisted of inferior growth of coppice with standards of about 100 years of age. The soil varies from sand to a loam and even clay loam, generally of good depth, but in places the stone is quite near the surface. The elevation varies between 300 ft. and 500 ft. and the ground is variously sloping. The original scheme proposed that the planting should extend over a period of sixteen years and this has been carried out. The plantations vary in size and species, but mainly the idea is to replace the original hardwood crop with a coniferous one, either by clearing wholly or partially and replanting. The growth is very variable and one meets a considerable area of the unusual mixture of Scots pine and Douglas fir in places which does not appear to do very well. In some parts of the wood other species are making good headway, notably Japanese larch, as will be seen in the following class. We consider that

if the coppice shoots had been cleared more from the young plantations in the third and fourth years, they would not require helping at the eleventh and twelfth years (as is now being done at a much bigger cost), and that the general and economical result would have been better.

Class 10.—Plantation consisting of the rarer conifers, pure or mixed with other trees, and not less than five years' growth and not less than 2 acres in extent. There were four entries, and the one awarded the Silver Medal was a portion of the plantations belonging to the Rt. Hon. J. F. Hope, and consists of nearly 3 acres of Japanese larch fifteen years of age. It was planted originally with Japanese larch 4 ft. apart with a few Douglas fir in mixture, but the larch have almost entirely crowded out the Douglas fir. In the year 1920, after twelve years' growth, the area was cleaned, and all the dead and suppressed trees were taken out. At that time a sample plot of thirty-six trees was established in the centre of the plantation and the individual trees were measured, the quarter girth varying between $1\frac{1}{2}$ in. to $3\frac{1}{4}$ in. The same trees have subsequently been measured every year, and on April last the quarter girth varied between $1\frac{1}{2}$ in. and 4 in., the average being about 3 in. with a height of $25\frac{1}{2}$ ft. On this basis the volume of the present crop is about 500 cu. ft. per acre. The crop, however, is considered to be overstocked and needs further thinning, since only the dead and suppressed trees have up to the present been removed.

The Bronze Medal was awarded to the Marquis Camden for a ten-years-old plantation of Douglas fir extending to 10 acres of ground which was formerly old coppice with standards. The soil was a sandy loam, the ground a moderate slope and the situation a sheltered valley running east and west. The plants were seriously attacked by pine weevils after planting, but this was remedied by the use of traps and hand-picking. The effect of the damage and further frost damage, however, remains and the crop is uneven and patchy. The best trees reach as much as 25 ft. in height with $3\frac{1}{2}$ in. quarter girth, but the average is very considerably below this, for in places the damaged trees and others where there appears to be a pan in the soil do not reach more than 3 ft. in height. In this class was entered, under a misconception of the rules, the collection of conifers at Kenfield Hall, Petham, Canterbury, which contains some fine specimens of rarer conifers, amongst which may be mentioned a tree of *Abies Bracteata*, 77 ft. in height with a quarter girth of $18\frac{1}{2}$ in. at breast height.

Class 11 is designed for the best-managed woodlands on an estate of not less than 1,000 acres in area, the Judges to take into account the production of timber, ornamental plantings,

planting for sporting purposes and improvement of residential amenities and proper management of hedgerow timber.

The Special Medal was awarded to the Executors of the late W. D. James in respect of the woodlands of West Dean Estate, Sussex. This estate is well known for its woodlands, it has been the object of numerous visits by parties of members of the Royal English Arboricultural Society and, in relation to its production of Douglas fir upon chalk, has received attention in their Journal from time to time (*e.g.* Vol. XI, pp. 1-6), so that an extended description here is thought to be unnecessary.

Of the 7,000 acres, the woodlands cover about 1,500 acres, and may be divided into three sections consisting of about 500 acres of old coppice with a few standards, about 550 acres of beech and other hardwoods and about 450 acres of conifers, mostly under fifty years of age. Before the war the large shooting rent of £2,000 per annum was obtained, so the forester has to carefully study game, and yet for many years the woods were being improved in value, while they were yielding a net return of £1,500 per annum. The soil is mainly a calcareous loam or chalk with flints overlying cretaceous chalk, the rock lying at varying depths below the surface, but over the majority of the area is within a few inches of the surface. The remaining portion of the area, mostly within the park, is found with a soil of alluvial clay. Most of the woods are between 400 and 550 ft. above sea-level, the higher portions being directly exposed to all winds, including that from the sea, which lies a few miles to the south and south-west. The average rainfall is between 35 and 40 in. per annum. Before the war there was in active progress a scheme for the gradual felling of the beech woods, which are mostly reaching maturity, replanting with a mixture of conifers and hardwoods with a view to a future final crop of beech, and the clearing and replanting of the coppice with standards section. During the war very large quantities of beech and coppice were cut, and the present operations consist in replanting those felled areas. When they have been re-stocked the original plan will be resorted to, and the anticipated annual felling and replanting programme is about 40 to 50 acres. The favourite mixture now used is three-quarters larch and a few Scots pine "to keep the woods warm," with the remainder beech for the final crop, the group system being to some extent used. On the chalk, beech, the natural tree of the soil, grows to perfection, and whilst the best woods were felled during the war, there are some very fine blocks still remaining. Ash grows well up to a stage when it becomes badly cankered, and on this account is being left out of the choice of species. Aided by the moist climate, most conifers grow rapidly, and there are magnificent trees of Douglas fir of about fifty years of age

growing healthily and vigorously on a flinty soil only 6 in. deep before the solid chalk is reached, these trees frequently reaching over 80 ft. in height ; there are also many larch growing to perfection in the older beech woods. On the alluvium the oak is of very good quality and makes comparatively rapid growth, but the older spruce are now beginning to die back, probably owing to underground drainage.

The park and ornamental gardens form a well-known feature of the estate, containing as they do a very fine collection of trees of both rare and better-known species. There are magnificent samples of many trees, including one Douglas fir about 130 ft. high with over 300 cu. ft. of timber. Other essential features are the presence of three nurseries, one central with seed-beds and two district nurseries for raising all the plants used on the estate. We found these very clean and filled with healthy 2 year 1 year plants, at which age they go out into the woods. Two year seedlings are largely bought for this purpose—all excellent forestry practice, and the results in the young plantations are equally good. There is also a sawmill consisting of a portable engine, one rack and one push bench, with good-sized yard and sheds for storing and seasoning home-grown timber, which is largely used for construction and repairs. At some distance, owing to lack of space at the sawyard, is kept the creosote tank for dipping fencing materials and gates. Creosoted beech is largely used on the estate, and we saw examples of palings which have been in service over twenty years heaped up on one side with farmyard manure, and on the other, till recently, covered with a heavy growth of ivy, and yet they are still perfectly sound. The woodland hedges present a very neat, strong and well-stocked appearance, but owing to the soil and exposure hedgerow timber is scarce. Finally, there is a complete record, with plans and descriptions, of all operations that have taken place in the whole of the woodlands for the last fifty years or so, in which accurate account has been kept of all expenditure and receipts—a feature which one could wish were found on very many more estates, both large and small.

The Silver Medal was awarded for the only other entry in this class to Lieut.-Col. Courthope. The woodlands of Whitliff consist of about 600 acres of scattered woods and shaws, about one-third of which are narrow gills and old marlpits. The latter are usually included in the farm tenancies, subject to the landlord's sole right to timber trees, tellers and saplings, whilst the tenant has the underwood. The remaining 400 acres consisted in 1910 almost exclusively of coppice with standards, the former principally chestnut, with a few small areas of ash, and the latter mainly oak, with a certain proportion of ash. In addition to the woodlands, some 300 or 400 acres of pasture in the park

were greatly overstocked with oak timber, much of which was very fine. Practically no felling other than coppice and no new planting had been done for about 100 years previous to this date, and as a consequence the coppice was largely suppressed. Hence it was decided to go systematically through the woods, felling the large oak, relying upon natural regeneration for re-stocking with that species, replacing the suppressed underwood with fast-growing exotic conifers, at the same time retaining the best areas of chestnut coppice as such on an eleven-year rotation, and to add further areas of land to the woods.

In carrying out these resolutions the estate sawmill was placed on a commercial basis, and with its present equipment it deals with an average of 30,000 cu. ft. of timber per annum, amongst which is some of the finest and largest oak in the country. Utilization is intensive to a degree and numerous classes of material are produced in the mill, from small shingles to the truly remarkable beams that have been used in the reconstruction of the roof of Westminster Hall.

In the re-stocking of the woodlands many experiments have been undertaken, such as (a) the planting of various species of different sizes, without protection, in woods infested with rabbits. In this connection the result of experience shows that if a plant is placed in a clump of briars, brambles and other rubbish without disturbing the clump, the rabbits generally leave the plant alone so long as the clump remains intact; for this method, of course, very large plants are required, and by this means success has been achieved. (b) Wide spacing of big plants in rough areas, the clearing of which would be costly. The tree that stands this treatment best, the Douglas fir, is being chiefly used, and where it is kept free from overhead coppice growth is promising well. (c) The planting of Douglas in an area of ash standards and coppice; and (d) the brushing of Spanish chestnut coppice to one stem per stool. All of these will be most interesting in the course of a few years.

The new land being taken in gradually consists mostly of places where landslides have occurred. In planting they are rounded off for game and amenity purposes.

The estate possesses a nursery for raising its own plants, of which about 30,000 to 40,000 are used per annum.

ESTATE NURSERIES COMPETITION.

The competition for the best-managed general estate nursery attracted six entries.

The Silver Medal was awarded to Major the Hon. Harold Pearson, Cowdray Park, Midhurst, for the nurseries at Cowdray

Park. These were in sections, totalling about 6 acres. The largest of these, 3 acres in extent, forms the permanent estate nursery. It is situated on slightly sloping ground with a south-west aspect, the soil of which is derived from the lower greensand and is very fertile. The usual practice of cropping a portion each year with a cleaning crop and manuring at that time is adopted. At the time of our visit part was under crop, part under seed-beds of the previous and current years, and the remainder under transplants. The previous year's seed-beds of Scots pine, Corsican pine and Douglas were good and even, the larch was rather poor. The present year's seedlings of larch, Scots pine, beech and Douglas were just appearing and gave promise of being a very good crop. The transplants were home-raised Douglas, Sitka, larch, chestnut, and a few bought-in larch, all of which were in a flourishing condition and showed very few failures or badly-grown plants. The whole nursery was well kept and was most impressive.

The other sections were temporary ones formed within the park on an old woodland site which, for amenity purposes, had been felled and grubbed. The soil was a deep, rich, sandy loam, the ground gently sloping with a south aspect and very well sheltered. The whole of the stock consisted of transplants which were growing very rapidly, for instance, by the end of May, the Scots pine had in many cases already grown an 18-in. shoot in spite of the lateness of the season and although transplanted only a few weeks earlier. The Douglas consisted mostly of 2 year 2 year 1 year plants, which at the time of our visit were just beginning growth and looked very healthy. No figures of the costs were available.

The Bronze Medal was awarded to the Marquis Camden for the estate nursery at Bayham Abbey, which was $1\frac{1}{2}$ acres in extent. The soil in this instance was somewhat heavy, and whilst the results in the lines were good, those in the seed-beds were patchy, the Scots pine being good and the larch fair. The nursery was well kept and the management economical, the cost of 2 year 2 year plants home-raised from seed being given as Scots pine, 10s.; Douglas fir, 11s.; spruce, 9s.; and ash, 9s. per 1,000. When two-year seedlings were bought in the costs were much higher, as, for instance, 30s. per 1,000 2 year 1 year larch. One interesting feature was the process of raising hedges in this nursery. A complete length of hedge is grown and trimmed in the nursery, so that when a section is required on any portion of the estate the hedge is lifted and each individual plant replanted in the same relative position as it had previously grown. By this method, it was claimed, the new hedge is complete and uniform at once instead of having to wait for a period of years to reach that stage as is usually the case. }

Whilst dealing with nurseries we may refer to the divergence of opinion regarding the amount of manuring required in a nursery. That nursery crops demand manure is undoubted and, according to investigations by von Schroeder, the average quantity of the three most essential plant foods needed in one year by one to three-year-old spruce is about equal to the amount absorbed from the soil by a crop of corn, potatoes, or meadow hay.

The practice of manuring in this country falls mainly into three classes. In some cases the only manure used consists of a green crop ploughed in, whilst in others very heavy doses of farmyard manure and compost are given (in one case we came across the dressing given every fifth year amounted to 100 loads of leaf-mould compost, 100 loads of farmyard manure, and 30 cwt. of burnt lime per acre), whereas the general rule is to manure with a cleaning crop. In our opinion the first method is due to the view that the plant is destined for generally a poor soil and that the conditions of even an unmanured nursery are superior to those that are to follow and it is inadvisable to transfer to too great a difference of fertility. There is much to be said in favour of this, but in the first place it generally happens that plants take at least an extra year to reach the required size in such a nursery, which means an extra year's weeding and cleaning costs, and often dislocation of the planting programme or recourse to purchase from nurserymen when everyone else has had his choice of plants from the stock available. Further, a good root system is most necessary in a transplant, and either the slower-growing transplants must be frequently transplanted, at extra cost, or the owner must be content with an inferior root, which, in turn, implies a future plantation of inferior quality. The system of heavy manuring produces, on the other hand, very rapid-growing plants. The disadvantages attaching to this are, firstly, that the plants are very soft and are likely to suffer a sudden check when planted out. Secondly, whilst a tall, lanky plant may be useful under certain conditions of tall growth of bracken and herbage, there are comparatively few places where there is a complete lack of winds, and not only do such plants withstand wind badly at a season of the year when there is little protective herbage, but the extra firming frequently required is expensive. Thirdly, the losses amongst such plants as these are generally heavy, entailing further expense in replanting. Finally, raising plants with a heavy initial manure cost must be an expensive business.

Thus we turn to the medium course where the manuring of a previous cleaning crop is sufficient to produce good, sturdy and well-rooted 2 year 1 year or 1 year 1 year plants, which,

as a rule, do not suffer much of a check in planting out, provide under normal circumstances a large percentage of successes and can be raised at a cost which is not excessive. We feel that, as in most cases, the medium course is the best.

It may be of interest to direct attention to the question of thinning larch. There are many larch plantations in the country that have reached the stage when a decision has to be made as to what sort of thinning shall be given. In the majority of cases the thinning made is a light one, and we would suggest that it might as a rule be much heavier than is the case. There are many sample plots of larch in the country, and in every case those producing the largest quantity of timber are the ones that have been very heavily thinned. Further, there appears to be no doubt that a heavy thinning reduces the risk of serious loss by canker, for there is less whipping amongst the trees, air circulates more readily, and by frequent thinning cankered trees can be removed when the disease is in an early stage. It is admitted that grass and other vegetation will come in earlier if thinnings are heavy and early, but it is only anticipating by a few years, and underplanting will be of more service if done early and allowed the little extra light.

In some parts of the country an impression is becoming general that large Douglas fir plants, say 3 ft. and upwards, get away in favourable soils as well as do smaller plants. This point appears to be worth following up, for, if it is really so, the Douglas fir becomes a most useful tree in those areas where bracken and weeds are very strong. It would be of great advantage to be able to shorten the period taken by plants to get their heads well above other vegetation and thereby greatly reduce the cost of cleaning operations in the initial stages of a plantation.

The Judges take this opportunity of expressing their thanks to Mr. W. Dawson for the excellent arrangements made for their tour, to Major Pearson and Colonel Courthope for their very kind hospitality, and to all those other gentlemen who contributed in many ways towards the facilities which were very kindly placed at their disposal for viewing the exhibits.

CHARLES P. ACKERS, }
ARCHIE P. LONG, } *Judges.*

REPORT OF THE JUDGES ON THE ORCHARD AND FRUIT PLANTATION COMPETITION, 1923.

(Restricted to the Counties of Kent, Surrey and Sussex.)

We were asked to adopt the method of scoring used in 1922, as this had been found to work satisfactorily.

A. System of Planting	15
B. Pruning and Shape	10
C. General Vigour and Productiveness	15
D. Freedom from Disease and Pests	15
E. Land Cultivation	15
F. Selection of Varieties	5
G. Commercial and Economic Aspect	15
H. General Appearance	10
<hr/>	
Total	100

This system on the whole worked very well, but had a tendency to favour the more recently planted orchards, as, naturally, men had profited from earlier mistakes which only manifested themselves years later on development.

It was arranged that we should commence our duties early on Tuesday, May 29, in accordance with an itinerary admirably drawn up by Mr. G. H. Garrad, Agricultural Organizer for the County of Kent, and his assistant, Mr. Bagenal. Mr. Bagenal acted as our guide throughout Kent and saved us much valuable time in locating the various entries.

The itinerary for the Counties of Surrey and Sussex was in the capable hands of Mr. E. C. Boughton, Secretary to the Federation of British Growers, and his arrangements worked most smoothly.

We were most hospitably entertained by every one we met and our special thanks are due to :—

Mr. Fitzwalter Plumptre, Goodnestone Park.
Mr. T. Neame, Macknade.
Mr. W. R. Elgar, Sittingbourne.
Mr. H. M. Cobb, Higham.
Mr. W. Alexander, Eynsford.
Mr. C. S. Smith, Boughton Monchelsea.
Col. Cornwallis, Linton Park.
Mr. A. T. Miller, Swanley.
Mr. W. W. Pertwee, Barnham,

who, in addition to offering us hospitality for the night, very kindly provided us with cars to visit the various entries in the competition. In common with the rest of the country, the Southern Counties this year were not looking their best, owing to climatic conditions. The mild winter, followed by a wet and cold spring, had made cultivations most difficult to perform, and the trees, checked in their development by continuous low temperatures and cold winds, had had to meet one of the severest insect and fungoid attacks experienced for some considerable time. That the general body of fruit growers met and overcame this attack as well as they did is greatly to their credit. As is usual with a large body of men, a few did nothing; the result being disaster to themselves and damage to their neighbours. We saw one particular instance of this which we think should be put on record. We were inspecting one competitor's plantations which had had a bad attack of caterpillar, aphid, etc., but by hard work and continuous spraying he had kept it under control, so that his actual loss was slight except on part of one side of his plantation where it ran parallel with that of a neighbour. His neighbour had done nothing, with the result that his plantation was quite brown, having neither fruit nor leaves on the trees. The caterpillar, having finished off the neighbour's plantation, had come through the hedge and across the headland and attacked the competitor's trees. The outside row of trees for the full length of his neighbour's plantation was bare of leaf, and the second row was suffering slightly; yet he had sprayed that row five times and had sprayed his neighbour's outside row over the hedge twice! Fortunately his neighbour's plantation only ran parallel with his for a few hundred yards.

While on the subject of pests we would mention that we found capsid fairly prevalent in a few places, but generally speaking it is not yet serious in the South. Considering what enormous damage this pest has done in other parts of England, it would be a calamity if it got a big hold in the South. The bad aphid attack experienced this year may therefore turn out to be a blessing in disguise, as no doubt the steps taken to meet it would, at the same time, give the coup de grâce to the capsid.

Autumn grease banding we found thoroughly carried out generally, and where material of the tanglefoot type had been used the results were quite satisfactory. We are of opinion that the freshening up of grease bands in the early spring is of considerable importance, as where this had been done we found on the bands large numbers of the apple-blossom weevil, clay-coloured or leaf-eating weevil, and larvae of the winter moth and various caterpillars of the tortrix tribe. We are of opinion that the clay-coloured or leaf-eating weevil does more damage

than is generally supposed, much of its work being commonly attributed to winter moth caterpillar. Many bands had scores of these weevils on them. We did not find any growers putting the grease direct on the trees, a practice now somewhat prevalent in the Evesham and Pershore districts, where it has been carried on for some years without so far any apparent deleterious effect.

We were sorry to find silver leaf very prevalent amongst plums and cherries, and in one case it had spread rather badly to Early Victoria Apples in the same plantation. Most of the advertised remedies had apparently been tried without much effect except in one instance (Col. Lumley Webb's, Newington) where we were shown about 75 plum trees in a grass orchard which had all shown Silver Leaf the previous year, and had been dressed in the late summer. In this case we were unable to find any silvering of the new leaves. The spraying outfits and methods varied considerably.

The plant erected for lime spraying by Messrs. J. Edmonds & Sons, of Allington, was quite unique and, we were informed, very efficacious.

We considered the plant of Capt. Mannington, of Marden, to be the most economically worked and best we saw for ordinary purposes. This plant was worked from a central Power Station at the house. It drew its own water from the river and by means of underground mains the washes were pumped wherever required, stop taps being provided where necessary in the orchards, the power being further utilized for grinding and other general farm purposes.

As to crops, apples appeared, in top fruits, to be the crop of the year. We saw very many fine orchards, some of which, taking into consideration the age of the trees and the crops they were carrying, were remarkable. In nearly all cases, however, the trees had originally been planted too close and the fillers left in too long, giving the orchards now a very crowded appearance.

Pears were almost a complete failure as a crop this year, though we saw what, in a normal year, should be splendid plantations, particularly on the brick earth in the Sittingbourne district. We found Pear Midge very prevalent in places, and thought it was a pity that the attacked pears had not been picked off and destroyed, a simple matter in a season like the present when there is very little crop, and thus an attack in future years would have been prevented.

Cherries were very light indeed, only in one orchard did we see anything approaching a crop.

Plums were on the whole thin, and badly attacked by Aphid and Brown Rot. Gooseberries and Red Currants were fair, but

Black Currants in Kent were poor. In Sussex Black Currants were fair, and in one small plantation we saw a full crop.

Raspberries had suffered from late frosts and cold winds, and would not be anything approaching last year's crop.

Strawberries generally very fair.

We regret that in the principal fruit growing district in England there were not more entries, particularly in the small area classes. In the large area Classes 2 and 4 the entries were good, being 17 in Class 2 and 16 in Class 4, and it was most noticeable that the quality of the exhibits in the smaller area classes with two exceptions (viz. the 1st prize winners in Class 3 and Class 7) was inferior to that of the larger area classes. The following is a list of the Awards:—

- CLASS 1. No Entry.
- CLASS 2. First. C. C. & R. T. Brissenden, Little Butts, Cousley Wood, Wadhurst, Sussex.
Second. Exors. of W. W. Gascoyne, Bapchild Court, Sittingbourne, Kent.
Reserve. Capt. Manington, Tanner House, Marden, Kent.
Highly Commended. W. F. Gaskain, Dargate Farm, Nr. Faversham, Kent.
Highly Commended. Col. J. F. Honeyball, Teynham, Kent.
Commended. H. M. Cobb, Higham, Rochester, Kent.
- CLASS 3. First. H. S. Marsham Townshend, Scadbury Park, Chislehurst, Kent.
Second. Geo. A. Batchelor, Gattons Farm, Cliffe, Rochester, Kent.
Reserve. Thos. Foat, Laurel House, Ash, Nr. Canterbury, Kent.
- CLASS 4. First. A. T. Miller, Wested Farm, Swanley, Kent.
Second. Col. J. F. Honeyball, Teynham, Kent.
Reserve. H. M. Cobb, Higham, Rochester, Kent.
Highly Commended. Jas. Edmonds & Sons, Allington, Maidstone, Kent.
Highly Commended. Exors. of W. W. Gascoyne, Bapchild Court, Sittingbourne, Kent.
Commended. F. & T. Neame, Macknade, Faversham, Kent.
Commended. C. S. Smith, Boughton Monchelsea, Maidstone, Kent.
- CLASS 5. First. Only one entry. No award given.
- CLASS 6. First. G. J. Wright, Redhill, Surrey.
Second. West Barnham Fruit Farm, West Barnham, Bognor, Sussex.
Commended. W. F. Gaskain, Dargate Farm, Faversham, Kent.
- CLASS 7. First. West Barnham Fruit Farm, West Barnham, Bognor, Sussex.
Second. Joseph Blundell, The Rungelow, London Road, Halstead, Nr. Sevenoaks, Kent.
Reserve. H. S. Marsham Townshend, Scadbury Park, Chislehurst, Kent.
- CLASS 8. First. W. H. Benstead & Son, Maidstone, Kent.
Second. E. C. Golding, Bingleaves, Tonbridge, Kent.
Reserve. C. S. Smith, Boughton Monchelsea, Maidstone, Kent.

Taking the classes seriatim :—

Class 1. No entry.

Class 2. Here we were met with the serious difficulty of having orchards containing cherries only pitted against mixed orchards of apples, pears and plums, the latter being subjected to diseases far in excess of those attacking cherries only.

The First Prize orchards, Messrs. Brissenden's, consisted wholly of apples (27 ft. by 27 ft.). The trees were well shaped, full of vigour, had been well limewashed, were clean and carried a fine crop. A very nice pasture due to slag under the trees, well grazed by sheep. Only fault, planted rather too closely.

The Second Prize, Exors. of W. W. Gascoyne, was a very fine orchard entirely of cherries, practically free from pests and diseases, and carried 70 per cent. of a crop. The heaviest crop of cherries we saw.

Reserve, Capt. Mannington. His orchards were well sprayed and in good order, carrying a nice crop of most varieties of apples, and a fair crop of Monarch Plums. Here again planting too close.

V.H.C. Col. Honeyball's was a mixed orchard of cherries, pears, plums and apples, fairly free from pests, cherry crop light.

Class 3. First Prize, Mr. H. S. Marsham-Townshend. A very nice orchard, mainly Cox's Orange Pippin. Had been neglected in the War, but by proper attention and cultivation had been got back into a thoroughly healthy, clean and profit-bearing condition. Reflected great credit on the management.

Second Prize, Mr. G. A. Batchelor.

The entries in this class only numbered 7, and the quality generally was not good with the exception of the First Prize Winner.

Class 4. First Prize, Mr. A. T. Miller. This plantation was in first rate condition, nearly all varieties carrying a full crop, practically free from pests, trees healthy and vigorous, and cultivations economically and excellently done.

Second Prize, Col. Honeyball. Another excellent entry. Clean, vigorous and full crop. Planted rather close, entailing all hand labour. Excellently managed.

Reserve, Mr. H. M. Cobb. Very good on the whole. Full crop of all varieties of apples. Clean, nicely cultivated, and well managed. In this class many excellent exhibits were shown, and the scoring was very close between the first three.

Class 5. One entry, no award given.

Class 6. First Prize, Mr. G. J. Wright, who entered 15 acres

of Raspberries (Antwerps). They were well cultivated, posted and wired, but had suffered slightly from the low temperatures experienced in the late spring.

Second Prize, West Barnham Fruit Farm. A young plantation of Black Currants, clean, well grown, and well cultivated. Rather a lot of reverted bushes, which had the appearance of having been originally struck from reverted stock as no big bud could be found.

This class was not strong or conspicuous for quality.

Class 7. First Prize, West Barnham Fruit Farm. An outstanding exhibit of Royal Sovereign Strawberries. Extraordinary growth of leaf and blossom. Almost too well done. Danger of fruit rotting in a wet time. Second Prize, Mr. J. Blundell, whose exhibit showed what could be done by good management under poor natural conditions.

Class 8. First Prize, W. H. Benstead & Son. An excellent plantation of nuts, well cultivated and clean, about 60 years old, free from caterpillar.

Second Prize, E. C. Golding. Another excellent plantation in good condition, caterpillar in places.

Nearly everywhere we went criticism was freely invited; in fact one or two competitors informed us they had entered solely for that purpose.

Generally the top fruit growing (Apples, Pears and Cherries) was good, but we expected to see much better Black Currant and Strawberry growing. As far as we could judge very little effort was being made to combat imported fruit by growing choice dessert varieties and by improved packing methods; at least we were not shown an up-to-date packing house, but we were informed that several of the largest growers had not entered. Another matter of surprise to us was the preponderance of culinary apples over dessert kinds. Apart from Cox and Charles Ross we do not appear yet to have produced a prolific, good coloured, and good quality dessert apple which we can put up against our foreign and colonial competitors in the late autumn, winter, and spring.

RALPH DIXON, } *Judges.*
F. P. NORBURY, }

REPORT OF THE COUNCIL TO THE
ANNUAL GENERAL MEETING OF GOVERNORS
AND MEMBERS OF THE SOCIETY,

HELD AT THE

ROYAL AGRICULTURAL HALL, ISLINGTON, LONDON, N.,

On WEDNESDAY, December 12, 1923, at 2.30 p.m.

Membership.

1. The Council have to report that the list of Governors and Members has undergone the following changes since the Annual General Meeting on December 6th, 1922: 36 new Governors (including 11 transferred from the list of Members under By-law 7), and 1,008 new Members have joined the Society, and 3 Members have been re-instated under By-law 14; whilst the deaths of 3 Life Governors, 7 Governors, 1 Honorary Member, 88 Life Members, and 205 Members have been reported. One Governor, 14 Life Members, and 62 Members have been struck off the books under By-law 12, owing to absence of addresses; 1 Governor and 138 Members under By-law 13, for arrears of subscription; and 5 Governors and 304 Annual Members have resigned.

2. It is with deep regret that the Council have to report the death in August last of Mr. John T. C. Eadie, who had been one of their number since 1905 as the representative of Derbyshire. Mr. Eadie was well known as a breeder of Shire horses, and rendered useful services to the Society, more especially in connection with its visits to Derby in 1906 and 1921. Another whose passing has to be recorded was Viscount Chaplin, who during his long life was a prominent figure in the agricultural affairs of the country. Lord Chaplin became a Governor of the Society in 1870, and for many years served on the Council, holding office as a Vice-President from 1889 to 1907.

3. Reference has also to be made to the deaths of two other gentlemen who were at one time officials of the Society. Sir Ernest Clarke, who died in March after a prolonged illness, was Secretary of the Society for eighteen years, and, on his retirement in 1905, the Council, in recognition of his services, conferred upon him the Honorary Membership of the Society. Mr. J. Reginald Naylor, whose death occurred in February, served the Society as Surveyor from the time of the Derby Show of 1906 until December last, when he retired owing to ill-health.

4. Amongst other Governors and Members whose loss by

death the Society has to deplore are His Grace the Duke of Somerset, the Marquis of Cholmondeley, the Marquis of Ripon, G.C.V.O., the Earl of Carnarvon, the Earl Farquhar, G.C.B., G.C.V.O., the Earl of Plymouth, G.B.E., C.B., Viscount Portman, Lord Biddulph, Lord Hotham, Lord Kinnaird, Lord Northbourne, Lord Trevor, the Hon. N. Charles Rothschild, Sir Edward Green, Bart., Sir J. W. Kelk, Bart., Sir T. Barrett Lennard, Bart., Sir Edmund Nuttall, Bart., Sir M. J. McTaggart Stewart, Bart., Brig-Gen. Sir R. C. A. Bewicke-Copley, K.B.E., C.B., Sir Thomas Hewitt, K.C., Brig-Gen. Sir H. Godfrey Morgan, K.B.E., C.B., C.M.G., D.S.O., Sir H. J. Van Sittart Neale, K.C.B., Admiral Sir George Neville, K.C.B., C.V.O., Sir Charles Searisbrick, Sir T. T. Shann, Mr. F. C. Arkwright, Mr. J. G. Barford, Mr. Frank Bibby, Mr. Daniel Bragg, Mr. Henry Bridgman, Mr. Hugh Brown, Mr. George Cawston, Mr. C. H. Dixon, M.P., Mr. W. Duthie, Mr. Edward Owen Greening, Dr. Vaughan Harley, Colonel James F. Honeyball, Mr. T. M. Jarmain, Mr. John Lett, Mr. Ralph C. Palmer, Mr. W. Howard Palmer, Mr. R. W. Timmis, Mr. F. N. Webb, Mr. W. E. Whineray, and Mr. Joseph G. Williams.

5. In recognition of his services to agriculture, the Council have elected Mr. Charles J. B. Macdonald as an honorary Life Governor of the Society.

Number of Governors and Members on Register.

6. The above and other changes bring the total number of Governors and Members now on the Register to 13,543, divided as follows :—

- 294 Annual Governors ;
- 152 Life Governors ;
- 10,802 Annual Members ;
- 2,274 Life Members ;
- 21 Honorary Members ;

13,543 Total number of Governors and Members, as against a total of 13,325 on the Register at the time of the last Annual Report.

Presidency.

7. The Council have unanimously decided to recommend to the Annual General Meeting the election of Mr. Ernest Mathews, C.V.O., LL.D., of Little Shardeloes, Amersham, Bucks, as President of the Society, to hold office until the Annual Meeting in 1924.

Changes in the Council.

8. To fill a vacancy in the representation of the Division of Shropshire, Mr. E. Craig Tanner has been elected an ordinary

Member of Council. Mr. J. Howard Howard, who has represented Bedfordshire on the Council since 1900, has decided not to seek re-election.

Annual Election of Council.

9. The Members of Council who retire by rotation at the next Annual General Meeting are those representing the electoral districts of Group "A," which comprises Northumberland, Yorkshire—North Riding, Lancashire and Isle of Man, Cheshire, Derby, Northampton, Norfolk, Bedford, Hertford, Middlesex, Stafford, Worcester, Monmouth, Cornwall, Dorset, Hampshire and Channel Islands, and Scotland. Governors and Members resident in those districts have been communicated with, and the usual procedure is being followed for the election or re-election of representatives for the divisions concerned. An election is also taking place in the county of Durham, which, owing to its increased membership, is now entitled, under By-law 83, to elect one additional representative.

Dates of Meetings in 1924.

10. The Council will meet upon the following dates in 1924: February 6, March 5, April 2, May 7, June 4, July 2 (General Meeting of Governors and Members in Leicester showyard), July 30, November 5, and December 10 (Annual General Meeting at the Royal Agricultural Hall).

Accounts.

11. Under the By-laws, the balance-sheet has to be presented for consideration at the Annual Meeting. The Council therefore beg to submit the Balance-sheet, with the Statement of Receipts and Payments for the year 1922. These Accounts were published in Vol. 83 of the *Journal* issued to Governors and Members this year, having been certified as correct by the Auditors appointed by the Members and by the professional Accountants employed by the Society.

Income-tax Appeal.

12. A demand has been made on the Society for the first time in its history from the Revenue authorities to levy income-tax on the Show surpluses. A few years ago the Society appealed against the taxation of its income from ordinary sources, and was granted an exemption on the ground that its work was of an educational character, and could rightly come under the charitable clauses of the Finance Act. The claim now put forward is under Schedule D, and the Show is treated as a business. To this the Council demur on the following grounds:—

(1) That the Show is educational in every sense of the word, and the Society, in holding its annual exhibition of stock and of

implements, is not carrying on a trade or business, but merely the intentions of its founders as expressed in the Royal Charter granted to the Society in 1840.

(2) Any Show surplus goes to the reserve and the income derived from it is used for educational purposes. The members of the Society receive no pecuniary gain from any surplus. The fact that the Show is exempt from entertainment tax goes to prove that its nature is as stated.

It is not too much to say that but for the educational work done by the Society by means of its exhibitions, British stock would not hold the high position in the world that it does at present. The Appeal has been duly lodged, and will probably be heard during the month of December. Counsel have been engaged, and it is hoped that the Society's claim for exemption will be successful and will result in a final settlement of the question.

Newcastle Show.

13. The Town Moor again furnished the site for the showyard this year, when the Society for the fifth time went to Newcastle-on-Tyne. Exhibits in both the Implement and Stock sections made a highly creditable display, though slightly fewer than at Cambridge in 1922. H.R.H. The Prince of Wales visited the exhibition on two different days, and on each occasion was accorded a most enthusiastic reception by large crowds of visitors. Beautiful weather continued for practically the whole of the five days, and, although the attendance of 186,510 fell short of the total number of visitors to the Show at Newcastle in 1908, yet the financial result eclipsed that of any former Show. It is anticipated that the accounts to be presented to the meeting on December 12 will show a surplus of £19,101 11s. 2d.

At the general meeting held in the showyard, at which His Royal Highness was present, resolutions of thanks were heartily accorded to the Lord Mayor and Corporation and to the Local Committee, whose combined efforts did so much to bring about this splendid result.

Visit to Cockle Park.

14. Opportunity was taken by members attending the Show at Newcastle to visit, upon the invitation of the Committee of Management, the Agricultural Experiment Station for Northumberland, at Cockle Park. The party was received by the chairman (Alderman Sample) and the members of the Cockle Park Committee, and was taken round the station by Professor Gilchrist (who acts as Scientific Director on behalf of Armstrong College), and his colleagues. The Duke of Portland, the owner of Cockle Park, was also present to welcome the party, and a very interesting and profitable afternoon was spent at the Station.

Farmers' Milk Competition.

15. A competition on similar lines to that organized at Manchester in 1916 was held in connection with this year's Show. Samples of milk were taken at the receiving station and analysed by the local authorities. The competition was highly appreciated, and proved a success. The Medical Officer of Health of Newcastle-upon-Tyne states that the results go to prove that, although leaving something to be desired, Newcastle can congratulate itself upon having as clean, if not a cleaner, milk supply than any other city in the country.

Plantations and Estate Nurseries.

16. The counties of Kent, Surrey, and Sussex formed the area for the Plantations and Nurseries Competition this year. In the twelve classes there were 39 entries, and the Gold Medal offered by the Royal English Arboricultural Society for the best plantation was awarded to Major R. Alexander, Swift's Place, Cranbrook.

Orchards and Fruit Plantations.

17. Fifty-two entries were received in the competition for Orchards and Fruit Plantations, the area of which was also restricted to Kent, Surrey, and Sussex. The competition, which, as last year, was organized in conjunction with the Federation of British Growers, was highly successful. Growers in the counties named much appreciated the fact that the Society were endeavouring to carry out such useful work in a district which rarely receives a visit of the Royal Show.

Show of 1924.

18. The Eighty-third Annual Exhibition of the Society will be held on land adjoining Abbey Park, Leicester. The laying-out of the site of the show-ground, which has reached an advanced stage, has provided work during the past two winter seasons for many ex-Service men who otherwise would have been unemployed.

Prize List.

19. By increasing their grant to the Prize Fund from £7,000 to £10,000 the Society has been able in a large measure to relieve the Breed Societies of a burden which they have borne for a number of years. The total value of the prizes, including Cups, etc., will be nearly £15,000. The Leicestershire Agricultural Society will not hold their county show next year, and their members will receive privileges in connection with the 1924 Exhibition similar to those enjoyed by members of the parent Society. Offers of Champion and other prizes have been received from the following:—

Shire Horse Society, Clydesdale Horse Society, Suffolk Horse Society, British Percheron Horse Society, Hunters' Improvement and National Light Horse Breeding Society, National Pony Society, Arab Horse Society, Welsh Pony and Cob Society, Shetland Pony Stud Book Society, Shorthorn Society, Hereford Herd Book Society, Sussex Herd Book Society, Aberdeen-Angus Cattle Society, Argentine Aberdeen-Angus Association, Dun and Belted Galloway Cattle Breeders' Association, Dairy Shorthorn Association, Lincolnshire Red Shorthorn Association, Devon Cattle Breeders' Society, South Devon Herd Book Society, Longhorn Cattle Society, Red Poll Cattle Society, Blue Albion Cattle Society, British Friesian Cattle Society, English Guernsey Cattle Society, English Jersey Cattle Society, Midland Counties Jersey Club, English Kerry and Dexter Cattle Society, Co-operative Wholesale Society, British Goat Society, Oxford Down Sheep Breeders' Association, Shropshire Sheep Breeders' Association, Southdown Sheep Society, Hampshire Down Sheep Breeders' Association, Dorset Horn Sheep Breeders' Association, Wiltshire or Western Horn Sheep Breeders' Association, Ryeland Flock Book Society, Kerry Hill (Wales) Flock Book Society, Lincoln Long-Wool Sheep Breeders' Association, Leicester Sheep Breeders' Association, Society of Border Leicester Sheep Breeders, Wensleydale Longwool Sheep Breeders' Association, Cotswold Sheep Society, Exmoor Horn Sheep Breeders' Society, Black Welsh Sheep Breeders' Association, National Pig Breeders' Association, British Berkshire Society, Large Black Pig Society, Gloucestershire Old Spots Pig Society, Lincolnshire Curly Coated Pig Breeders' Association, Cumberland Pig Breeders' Association, Wessex Saddleback Pig Society, Essex Pig Society, Long White Lop-Eared Pig Society.

In the Poultry section special Prizes are being contributed by the Dorking Club, Sussex Poultry Club, Columbian Wyandotte Club, British Rhode Island Red Club, Barred Plymouth Rock Club, Buff Plymouth Rock Club, Indian Runner Duck Club.

Closing of Entries.

Intending exhibitors at Leicester are reminded that the latest date for receiving entries of horses, cattle, goats, sheep and pigs is May 1st. Entries of Produce close on May 20th; entries of Poultry close on May 31st.

Applications for space in the Implement, etc., Department must be made not later than March 20th.

Schedules and entry forms will be ready for issue early in the New Year.

Reduction of Charges for Space.

20. The Council do not propose to make any reduction in the fees charged for the exhibition of articles of a non-agricultural

character either in shedding or open ground, but for agricultural articles they have decided to reduce the charges as follows:—
 High Shedding, from £1 to 12s. 6d. per foot; Special Shedding, from 17s. 6d. to 12s. 6d. per foot; Ordinary Shedding, from 8s. to 6s. per foot; and Machinery-in-Motion Shedding, from £1 to 15s. per foot.

Collection of British Wools.

21. With the collaboration of the various Flock Book Societies, the Council have been able to arrange with the authorities of the University of Leeds to make an investigation into the spinning and manufacturing possibilities of wools from representative breeds of British sheep. Prof. Barker, of the University's Textile Department, has undertaken to manufacture various samples of cloth from different wools sent to him, and it is proposed that these, with a number of fleeces he has also received, should form the material for demonstrations to be given by him in a special pavilion in the showyard at Leicester next July.

Railway Facilities.

22. Endeavours have been made, both individually by the Society and in conjunction with other bodies, to obtain for Members the privilege granted by railway companies before the war of travelling to and from the Show at reduced rates; but, so far, the representations made to the Railway Clearing House have been unsuccessful.

Joint Committee of British Live Stock Breeders.

23. A Joint Committee of British Live Stock Breeders has been formed, and the Society has guaranteed a certain sum towards its funds. The object of the Committee is to secure fair and reasonable rates from railway companies for all kinds of live stock and for agricultural show traffic. The Committee appear by Counsel before the Railway Rates Tribunal when the rates affecting transport of animals are under discussion.

Show of 1925.

24. In 1925, as announced in last year's report, the Show will take place at Chester.

Judges for Argentina.

25. The Argentine Rural Society again requested the Council to appoint judges to officiate at their Show held at Palermo in September. The following gentlemen accepted the Society's invitation and proceeded to South America:—

Shorthorn Cattle—Capt. J. MacGillivray, Calrossie, Nigg, Ross-shire.
Hereford Cattle—Percy E. Bradstock, Free Town, Tarrington, Hereford.

Aberdeen-Angus Cattle—P. Strachan, East Town, Tarland, Aberdeenshire.

Pigs—George Will, The Farm, Crichton Royal, Dumfries.

Shire Horses and Lincoln Sheep—Harry Spilman, Kirmington Vale, Barnetby, Lincs.

Chemical Department.

26. There has been a very marked falling off in the number of samples submitted by Members for chemical analysis. Not only has the improvement shown in 1922 not been maintained, but the numbers have fallen below the 448 of 1921, reaching, in 1923, 394 only. For this there does not appear to be any adequate reason beyond the prevailing depression in agriculture and the desire to save expense. The one direction in which an increase in samples sent has been seen is in regard to the liming of land, a point that has often been urged. It would appear that attention has very rightly been given to this, and the results of analyses of different samples of lime, chalk, &c., indicate how necessary it is to take care as to the quality of what is supplied. A fair number of samples of soil have again been submitted, and in not a few of these the need of liming has been brought out. Basic slag as a rule has been found to be of guaranteed quality, and the important matter of fineness of grinding is now generally attended to. Indeed, in all cases where raw phosphatic minerals are concerned it has been established that fineness of grinding is essential to their profitable employment. Several samples of hops, dried in different ways, have been sent for examination, the general result being to show that the method of drying by hot-air kilns is superior to drying over open-fire kilns, hops prepared by the latter method always being likely to show some quantity of arsenic present.

Fertilisers and Feeding Stuffs Act.

27. At length the representations of this Society and of other agricultural bodies have borne fruit in the forming, by the Ministry of Agriculture, of a Departmental Committee to inquire into the desirability or otherwise of amending the present Act. This Committee, of which the Society's consulting chemist is a member, has already begun its sittings, and the Society has been asked to send a representative to express its views on this important but much-delayed subject.

Botanical Department.

28. The year's work has been without any features of especial interest, and no unusual inquiries have been received in the Botanical Department. The number of samples of seeds received for testing shows a slight falling off, but the diminution has not been as great as might have been expected as the result

of the passing of the Seeds Act. The character of the seed tested, however, has changed, for comparatively few of the samples were of purchased seed, the great majority consisting of home-grown cereals and clovers. Plant diseases have not proved unduly troublesome this season, with the exception of mosaic disease and leaf-curl in potatoes. An explanation for this is probably to be found in the failure to secure a change of seed. The pests of fruit trees formed a large proportion of the inquiries, and of cereals a singularly small one. Weeds for identification have again been sent in numerously. Many, as was the case last season, were from recently sown grass-land, their abundance suggesting—probably wrongly—that the seed sown had been far from pure. There has been an increased interest taken in the choice of varieties of several of the more important crops, and the inquiries indicate a tendency to make more use of autumn planting for both oats and barley.

Zoological Department.

29. The salient feature of the year as regards this Department has been the prevalence of aphid attacks on all kinds of crops, and 1923 will certainly be looked back upon as the aphid year. In other respects the work of the Department has been somewhat uneventful, and many pests of usual occurrence were practically absent or only injurious in a minor degree. This was especially true of the corn pests, frit-fly, for example, so prevalent in 1922, doing comparatively little harm during the past season.

The majority of the inquiries received had reference to insects injurious to orchard trees and bush fruit. Few forest pests were notified, but several animal parasites were sent for identification and advice.

Animal Diseases.

30. During the year there has been a considerable increase in the number of confirmed outbreaks of anthrax and swine fever, but a slight reduction in the outbreaks of parasitic mange in horses and sheep scab. Contrary to expectation, a few outbreaks of glanders have occurred since the end of last year, and a serious recrudescence of foot-and-mouth disease set in in August. In the first six months of the year 26 outbreaks had been confirmed, and during the following three months over 160 outbreaks occurred, distributed over 20 counties. The sequence of the outbreaks indicates that a considerable proportion were caused by a local dissemination of the infection in areas where the disease had broken out, but many others appear to have had an independent origin in virus introduced from abroad by some undiscovered means. No case of rabies has been reported during the year.

Sheep Scab.

31. On June 30 came into operation the Sheep Scab Order of 1923. This Order directly requires sheepowners to take such steps from time to time as are reasonably practicable to secure that their sheep are free from sheep scab. Occupiers of farms or holdings on which sheep are kept and owners of sheep kept on common land are liable, in case of failure to take such steps as above mentioned, to a fine of £20, or if the offence is in respect of more than four sheep to a fine of £5 for each animal, or in certain cases to imprisonment. In the case of proceedings instituted on or after July 1, 1924, in any case where sheep scab is found the burden of proving that the Order has been complied with will rest upon the person charged, and not upon the prosecutor.

The imposition of a minimum penalty, as originally contemplated, could not be enforced without fresh legislation, and in the opinion of the Minister of Agriculture it is not desirable to delay longer the issue of an Order which it was considered would be effective under the existing provision of the Diseases of Animals Acts as regards the imposition of penalties.

S.S. "Hartington" Incident.

32. The Council had brought to their notice in March an occurrence which, but for the prompt action of the Ministry of Agriculture, might have caused a most serious outbreak of disease in this country. It is understood that the steamer *Hartington* left Monte Video with a cargo of flour and feeding-stuffs, having also on board 250 cattle and 1,000 sheep. A few days after sailing, foot-and-mouth disease broke out, and the cattle were thrown overboard. When the boat reached Antwerp, nothing was said regarding the cattle or the outbreak of disease, and the captain was given a clean bill of health. A Belgian official, however, thought there was something suspicious about the cargo, as he noticed that the ship's manifest showed that it had carried cattle and sheep; and, as the boat was coming to London, he wrote to Sir Stewart Stockman, of the Ministry of Agriculture, about it. Unfortunately, Sir Stewart did not receive that letter until after the ship had reached London and had discharged part of her cargo. Immediately he heard of it he sent an inspector to the docks and also notified the Customs authorities, who were little inclined to think that such a thing had happened; but eventually the captain had to admit the facts. To avoid detection the ship's decks had been washed, and part of the manure and urine of the animals had penetrated the holds and infected the cargo. The Ministry of Agriculture immediately held up the whole of the feeding stuffs that had been discharged.

33. On the recommendation of the Veterinary Committee, the following resolution was passed by the Council and sent to the Ministry of Agriculture:—

“The Council of the Royal Agricultural Society of England have heard with grave concern of the occurrence of the s.s. *Hartington* disembarking a cargo of flour and middlings in the Port of London which had been contaminated whilst on board by cattle and sheep infected by foot-and-mouth disease.

“In view of the fact that the amendment of the Diseases of Animals Bill is now under consideration, the Council of the Royal Agricultural Society of England urge that a regulation should be inserted into the Bill to prevent the possibility of any recurrence of such incident, and respectfully suggests that no grain, offals from cereals, or other cattle food shall be permitted into Great Britain off a ship which has during the ninety days previous carried cattle, sheep, or pigs from a country in which foot-and-mouth disease is endemic.

“The Council desire to take this opportunity of expressing their appreciation of the vigilance and prompt action of the Ministry's officials in dealing with the danger arising from the cargo of the s.s. *Hartington*.”

The Council were subsequently informed that the Ministry, in consultation with the Customs authorities, were taking steps which would, it was hoped, prevent a repetition of such an occurrence.

Export of Horses.

34. A resolution in the following terms was endorsed by the Council at their meeting in April:—

“The Veterinary Committee of the Royal Agricultural Society of England recommend the Council of the Society to strongly oppose any interference with the present regulations governing the export of horses as embodied in the Order of the Ministry of Agriculture dated the 21st December, 1921, and entitled the Exportation and Transit of Horses, Asses and Mules Order of 1921, which are proving effective in their operation.

“In the event of any attempt being made to impose a tax upon horses exported they pledge themselves to oppose such attempt by all the means in their power, as it would prove most detrimental to the horse-breeding industry of the country.”

Importation of Breeding Cattle.

35. The proposal of the Minister of Agriculture to lay on the tables of both Houses of Parliament an Order authorising the

importation of *breeding* animals from Canada (in addition to *store* cattle, the importation of which is now permitted by Act of Parliament) has been considered on more than one occasion during the past twelve months. Resolutions of protest against such action have been passed by the Council, who are of opinion that the introduction of breeding animals would be most detrimental to the live stock of Great Britain.

Export of British Live Stock.

36. At the end of 1922, the Council resolved to form a Committee consisting of representatives of the R.A.S.E., the National Cattle Breeders' Association, the National Pig Breeders' Association, and the National Council of Pig Breeders and Feeders, to consider the whole question of the present live stock import regulations of the British Dominions overseas and foreign countries, with a view to drawing up a definite scheme and approaching the representatives of those Governments to obtain more favourable conditions for the exportation of British stock. This Joint Committee has drawn up a Memorandum embodying what may be termed an ideal code of regulations which might with safety be adopted by all the importing countries, and which would at the same time remove some of the restrictions by which the export trade in British live stock is handicapped at the present time. Copies of this Memorandum have been submitted to the representatives of the various Dominions and foreign countries.

Research Committee.

37. Investigations now in progress under the auspices of the Research Committee set up last year include experiments on the feeding value and improvement of pasture in Leicestershire and Yorkshire; two Silage experiments—one, clamp under the direction of Mr. Arthur Amos, at Cambridge; and another, tower, under the supervision of Mr. A. W. Oldershaw, in East Suffolk; two series of Pig Feeding Experiments—one by Prof. T. B. Wood, at Cambridge; and the other by Dr. Crowther, at the Harper-Adams Agricultural College; Yield Trials on Oats, conducted by the National Institute of Agricultural Botany; and also experiments on Cereals, more particularly Malting Barleys, at the Norfolk Agricultural Station. Reports will be presented in due course when the experiments are completed. Heads of Agricultural Colleges and Research Stations attended, by invitation, a special meeting in October, and gave the Research Committee the benefit of their advice regarding future work.

A leaflet has been prepared by Professors Biffen, Gilchrist, Somerville and Stapledon giving the results of present knowledge on the subject of laying down land to grass under different

conditions of soil and climate. It is hoped that the leaflet will be ready to be distributed with this report.

38. The Council desire to acknowledge the kind assistance of Mr. Arthur Holgate in placing his farm at their disposal and bearing the expense of the grass-land experiment in Yorkshire, and the generosity of Mr. A. E. Marsh in providing a sum of £1,000 for Pig Feeding Experiments.

Visit to Cambridge.

39. On August 1 a number of Members of Council and Governors paid a visit to Cambridge, where opportunity was afforded for the party to inspect the experimental work being carried out at the School of Agriculture and the National Institute of Agricultural Botany.

Medal for Agricultural Research.

40. Reference was made in last year's report to the renewal of the offer of the Society's Gold Medal for an essay or monograph giving evidence of original research on any agricultural subject or any of the cognate agricultural sciences. This year two monographs have been submitted.

Distribution and Prices of Agricultural Produce.

41. In response to an invitation to the Society, evidence has been given before the Departmental Committee on the Distribution and Prices of Agricultural Produce by Lord Bledisloe on Milk and Milk Products, and by Mr. John Evens regarding Cereals, Flour, and Bread.

By-laws and Standing Orders.

42. A special Committee has been appointed to consider and report on the question of the By-laws and Standing Orders for the procedure at Council and other meetings.

Swedish Agricultural Show.

43. A party of British agriculturists, at the invitation of the Swedish Government, visited the agricultural show held at Gothenburg last June in connection with the Exhibition and Fair held in commemoration of the 300th anniversary of the city's foundation. Mr. Alfred Mansell and Sir Douglas Newton attended this show as representing the Royal Agricultural Society of England.

Queen Victoria Gifts.

44. A contribution of £140 has been made by the Trustees of the Queen Victoria Gifts Fund to the Royal Agricultural Benevolent Institution for the present year.

Cattle Pathology Medals.

45. In the competitive examination for the Society's prizes for cattle pathology, the Silver Medal was this year gained by Mr. L. E. Perkins, 141 Clarence Avenue, Northampton; and the Bronze Medal by Mr. E. B. D. Hall, Chafford House, Fordcombe, Tunbridge Wells.

National Diploma in Agriculture.

46. At the Twenty-fourth Annual Examination held at the University of Leeds from April 4 to 12, ninety candidates were successful in gaining the National Diploma in Agriculture. See list on pp. 327 to 329.

National Diploma in Dairying.

47. The Twenty-eighth Annual Examination for the National Diploma in Dairying was held at the University College and British Dairy Institute, Reading, for English students, from September 7 to 15, and at the Dairy School for Scotland, Kilmarnock, for Scottish candidates, from September 21 to 29. Seventy-two candidates were examined at the English Centre, of whom forty-seven satisfied the Examiners, six reaching the Honours standard. Forty-eight candidates presented themselves at the Scottish Centre, of whom thirty-seven passed, including five with honours. See lists on pp. 332 and 333.

Congratulations to H.R.H. The Duke of York.

48. At their meeting on January 31, the Council took the opportunity to congratulate H.R.H. The Duke of York, who was President of the Society last year, on the occasion of his betrothal and approaching marriage to Lady Elizabeth Bowes-Lyon.

By Order of the Council,

T. B. TURNER,

Secretary.

16 BEDFORD SQUARE,
LONDON, W.C.
November, 1923.

NATIONAL AGRICULTURAL EXAMINATION BOARD.

I.—REPORT ON THE RESULTS OF THE TWENTY-FOURTH EXAMINATION FOR THE NATIONAL DIPLOMA IN AGRICULTURE.

HELD AT LEEDS, APRIL 4 TO 12, 1923.

1. The Twenty-fourth Examination for the NATIONAL DIPLOMA IN AGRICULTURE was, by the courtesy of the authorities, held at the University of Leeds, from the 4th to the 12th April last.

2. The subjects of Examination were Practical Agriculture (two papers), Farm Machinery and Implements, Land Surveying and Farm Buildings, Agricultural Chemistry, Agricultural Botany, Agricultural Book-keeping, Agricultural Zoology, and Veterinary Science. The whole nine papers could be taken at one time, or a group of any three, four or five in one year and the remaining group in the year following. Candidates taking the whole Examination in one year who failed in not more than three subjects, and candidates taking a second group who failed in not more than two subjects, were allowed to appear again for those subjects only next year. Candidates failing in one or two subjects of a first group of not less than four, or in a single subject of a group of three, were permitted to take those subjects again in conjunction with the second group.

Under a Regulation which came into force this year, all candidates, before sitting for the Practical Agriculture papers, must produce evidence of possessing a practical knowledge of Agriculture obtained by residence on a farm for a period or periods covering a complete year of farming operations.

3. Two hundred and four candidates presented themselves, as compared with 252 last year. Thirteen candidates took the whole Examination, 118 who had previously passed in certain subjects appeared for the remaining portion, and the other 73 candidates came up for a first group of subjects.

4. As the result of the Examination, the following 90 candidates were successful in obtaining the Diploma, the first three with *Honours*. The names of the other Diploma-winners are in alphabetical order :—

Diploma with Honours.

- 1st. DOUGLAS HUNTER FINDLAY, Glasgow University and West of Scotland Agricultural College.
- 2nd. EDMUND WHITTAKER, Jnr., Harris Institute, Preston.
- 3rd. WILLIAM EDWARD COLE, University College, Reading.

Diploma.

- CARL MARCUS ANDERSON, Harris Institute, Preston.
JOHN ARCHIBALD, Midland Agricultural College, Sutton Bonington, Loughborough.
REGINALD AUSTEN, Harper Adams Agricultural College, Newport, Salop.
PERCY WALTER BAILEY, Midland Agricultural College.
GEORGE STREVEVS BAKER, S.E. Agricultural College, Wye, Kent.
GEORGE JAMES ERIC BOWL, Harper Adams Agricultural College.
PHILIP TOM STANBURY BROOK, S.E. Agricultural College.
HUGH STUART CAMERON, Seale Hayne Agricultural College, Newton Abbot, Devon.
WILLIAM HENRY CASHMORE, Cambridge University.
FRANK COULTER, Leeds University.
HUGH BROCK COWELL, Cambridge University.
GEORGE DAVIDSON, West of Scotland Agricultural College, Glasgow.
HAROLD BENJAMIN DAVIES, Harper Adams Agricultural College.
MATTHEW ALEXANDER MURE DICKIE, Glasgow University and West of Scotland Agricultural College.
JOHN DUNCAN, Midland Agricultural College.
WILLIAM JOHN DUNCAN, East of Scotland College of Agriculture, Edinburgh.
JOHN ELLIS, Aberdeen University.
ALEXANDER BROWN FISHER, West of Scotland Agricultural College.
GEORGE KING FORSTER, Harris Institute, Preston.
WILLIAM FREDERICK FRANCIS, University College, Aberystwyth.
FRANCES ANN MICHIE GARDEN, West of Scotland Agricultural College.
BRYCE BLAIR GARVEN, West of Scotland Agricultural College.
ALAN CHARLES GOLDING, University College, Reading.
PETER GORRIE, East of Scotland College of Agriculture.
HERBERT BARCHAM GREEN, Seale Hayne Agricultural College.
IRWIN JAMES HANNAFORD, Seale Hayne Agricultural College.
JOHN JAMES MILLER HANNAH, West of Scotland Agricultural College.
RONALD PERCY HAWKINS, Leeds University.
FRED STARK HEMPSFED, West of Scotland Agricultural College.
FRANK ROBERT HORNE, Seale Hayne Agricultural College.
JOHN HOYLAND, Leeds University.
DONALD SOMERVILLE HUDSON, Midland Agricultural College.
HOWELL POWELL ISAAC, University College, Aberystwyth.
L. EWART JAMES, University College, Aberystwyth.
RICHARD GLYNNE JONES, University College, Aberystwyth.
ALEXANDER LAMBLE, West of Scotland Agricultural College.
JOHN FREDERICK LAWTON, Midland Agricultural College.
HAROLD ALFRED LEPPER, S.E. Agricultural College.
VINCENT LIVERSAGE, Harper Adams Agricultural College.
JAMES VINCENT LOCHRIE, Glasgow University and West of Scotland Agricultural College.
JOSEPH LYONS, Royal College of Science, Dublin.
WILLIAM MCCUBBIN, West of Scotland Agricultural College.
IAN SOMERLED MACDONALD, West of Scotland Agricultural College.
JOHN MCGREGOR, Glasgow University and West of Scotland Agricultural College.
RODERICK DAVID MACKAY, West of Scotland Agricultural College.

KENNETH MCKENZIE, West of Scotland Agricultural College.
 LESLIE DAVID CHRISTIE McLEES, Glasgow University and West of Scotland Agricultural College.
 JAMES L. McWHINNEY, Royal College of Science, Dublin.
 DAVID OGILVY MARSHALL, West of Scotland Agricultural College.
 ROBERT SMITH MARSHALL, West of Scotland Agricultural College.
 THOMAS MARLEW, University College, Reading.
 WILLIAM ALAN MARTYN, Harper Adams Agricultural College.
 ALEXANDER MATHESON, Glasgow University and West of Scotland Agricultural College.
 GERALD PATRICK LEVALLIN MILES, S.E. Agricultural College.
 PHILIP DENNIS MORCOM, Seale Hayne Agricultural College.
 GODFREY F. V. MORGAN, Seale Hayne Agricultural College.
 GWILYM TREVOR MORGAN, University College, Aberystwyth.
 WILLIAM JOHN MOYSE, Seale Hayne Agricultural College.
 ALEXANDER F. R. NISBET, Glasgow University and West of Scotland Agricultural College.
 ARTHUR NOBLE, Seale Hayne Agricultural College.
 BERNARD NORCROSS, Leeds University.
 LEONARD JOHN PACKHAM, Royal College of Science, Dublin.
 ROBERT THOMAS PATERSON, Glasgow University and West of Scotland Agricultural College.
 WILLIAM CECIL PATERSON, West of Scotland Agricultural College.
 ALEXANDER PATON, Glasgow University and West of Scotland Agricultural College.
 JOHN THOMAS PEARSON, University College, Reading.
 CHRISTOPHER FELL PORTEOUS, Armstrong College, Newcastle-upon-Tyne.
 ALBERT WYLIE PUNTER, University College, Reading.
 ERIC REA, University College, Reading.
 HUGH A. C. REID, East of Scotland College of Agriculture.
 SECRETAN RHYS-WILLIAMS, Midland Agricultural College.
 JOHN CAMPBELL RIDDELL, West of Scotland Agricultural College.
 RANDOLPH ALAN ROBBINS, University College, Reading.
 ERIC SCATCHARD, Leeds University.
 DAVID EBENEZER SIMPSON, East of Scotland College of Agriculture.
 HERBERT CHARLES STAREY, Harper Adams Agricultural College.
 ERNEST BROWNSON STEVENSON, Midland Agricultural College.
 JOHN STRANG, West of Scotland Agricultural College.
 FREDERICK NEWMAN TANNER, Harper Adams Agricultural College.
 JAMES DALGLEISH TURNBULL, East of Scotland College of Agriculture.
 HENRY JAMES TYREMAN, Seale Hayne Agricultural College.
 LESLIE JOHN WALKER, Harper Adams Agricultural College.
 JOHN PATON WALTERS, Seale Hayne Agricultural College.
 GEORGE WILLIAM HUMPHREY WEBB, Harper Adams Agricultural College.
 WILLIAM JOHN WILL, Glasgow University.
 JOHN WILLIAM WOODCOCK, Leeds University.
 CHARLES WORMALD, Leeds University.

5. Twenty-three of the candidates appearing for a second group of subjects failed in not more than two, and these will be permitted to take again next year the papers in which they failed; if then successful in passing they will be awarded the National Diploma.

6. Of the 73 candidates appearing for a first group of subjects, the 38 whose names are given below succeeded in passing and

will therefore be permitted, subject to the Regulations, to take the remaining subjects at next year's Examination.

DAVID THAIN ADAM, North of Scotland College of Agriculture, Aberdeen.

JOHN ERNEST BAKER, Seale Hayne Agricultural College, Newton Abbot.

AUSTEN STANSFIELD BARKER, Leeds University.

ABRAM BROADFOOT, Glasgow University and West of Scotland Agricultural College.

HUGH CALDERWOOD, West of Scotland Agricultural College.

ROGER CLOUGH, Seale Hayne Agricultural College.

GORDON COWAN, West of Scotland Agricultural College.

GEORGE DUNLOP DAVIDSON, Glasgow University and West of Scotland Agricultural College.

OSCAR WILLIAM HENRY FARRAR, Harris Institute, Preston.

ELIZABETH HELEN MARGARET FARRIES, West of Scotland Agricultural College.

LEONARD WALHANKE FURNESS, Midland Agricultural College.

ALAN VERNON GIBBERD, University College, Reading.

JOHN GILLIES, West of Scotland Agricultural College.

DAVID WILSON HENDERSON, West of Scotland Agricultural College.

HARRY CANDLER HUNT, Seale Hayne Agricultural College.

VIDA HELEN LAMB, West of Scotland Agricultural College.

JOHN RIAL LEE, Leeds University.

CLEMENT WHITWORTH LINLEY, Leeds University.

JAMES LYMBURN, West of Scotland Agricultural College.

ROBERT GORDON MACFARLANE, West of Scotland Agricultural College.

ALEXANDER STEWART MCKINNON, West of Scotland Agricultural College.

GAVIN MACNEILAGE, West of Scotland Agricultural College.

ARCHIBALD MCVICAR, Glasgow University and West of Scotland Agricultural College.

AGNES ADAM MEIKLE, West of Scotland Agricultural College.

WILLIAM EWART JOSÉ MILTON, University College, Aberystwyth.

CYRIL S. MORRIS, Seale Hayne Agricultural College.

JOHN COCHRAN MUIR, Glasgow University and West of Scotland Agricultural College.

WILLIAM ALLAN PORTER, West of Scotland Agricultural College.

FRANCIS ANDREW ROBB, Glasgow University and West of Scotland Agricultural College.

THOMAS RONALD SHAXSON, Seale Hayne Agricultural College.

MARGARET MAY SPEEDY, East of Scotland College of Agriculture.

ARTHUR LESLIE STICKLAND, University College, Reading.

STANLEY B. SUMMERS, West of Scotland Agricultural College.

RICHARD WALKER THOMPSON, Harper Adams Agricultural College.

AGNES BRODIE THORNLEY, West of Scotland Agricultural College.

WILLIAM EDWARD WATSON, Harper Adams Agricultural College.

FREDERICK CHARLES WHITE, University College, Reading.

CECIL SAMUEL GILL WORTHINGTON, Leeds University.

7. Twenty-seven of the unsuccessful candidates who sat for a first group of subjects failed in one or two, which, subject to the Regulations, they will be permitted to take again next year in conjunction with the second group.

8. The Reports of the Examiners in the different subjects are appended :—

PRACTICAL AGRICULTURE. (First Paper, 300 Marks. Second Paper, 300 Marks.) Prof. Wm. Somerville, M.A., D.Sc., Wm. Bruce, M.A., B.Sc., and G. H. Garrad, N.D.A.

The examiners in Agriculture have to report that the standard of preparation on the part of candidates appears to be much the same as in previous years. In their opinion there is evidence of failure on the part of Colleges to give instruction in the fundamental principles of Field Experiment work. But a more serious omission is neglect to bring before students the main results of the Rothamsted Experiments, which, in the opinion of the examiners, should be within the knowledge of all candidates for such an examination as this. There was clear evidence that the practical training of many of the English candidates was distinctly weak, particularly in arable farming.

FARM MACHINERY AND IMPLEMENTS. (200 Marks.) Prof. R. Stanfield, M.Inst.C.E.

Most of the 101 candidates who were examined in farm machinery and implements answered the questions in a satisfactory manner, and there was a distinct improvement as compared with previous examinations. There is no doubt that the principle of action and working of agricultural machinery and implements has received special attention, but in this respect it was evident that much of the information has been obtained from text-books, and not from actual working experience; it is most desirable that the candidates should have an opportunity of carrying out experiments with engines, etc., in general use on most farms. Some of the candidates were weak in questions involving simple calculations, and it was clear from the answers in the oral examination that very little instruction had been given in the more elementary physical laws; this is a matter that should receive serious attention in the future.

LAND SURVEYING AND FARM BUILDINGS. (100 Marks.) Edward Walford, F.S.I.

Generally speaking, candidates showed a better and more accurate knowledge in surveying than in elementary building. The latter papers, and the *vis à vis* especially, brought out an entire lack of any sort of practical knowledge, with very few exceptions. The subject appeared to have been crammed from a few college lectures, the teaching in which did not always appear to be of the best. On the whole there were not many really bad papers, though really good ones were scarce.

Some candidates again handicapped themselves through not bringing the required scales, or through not reading the questions carefully.

AGRICULTURAL CHEMISTRY. (300 Marks.) Sir John Russell, D.Sc., F.R.S., and J. F. Tocher, D.Sc.

The candidates this year showed signs of better preparation than before. There is still, however, some weakness in regard to the more elementary parts of the subject, and we still find candidates who had prepared acetamide and other organic substances in the laboratory and at the same time did not understand the guarantee on which potassic and phosphatic manures are sold.

Several candidates showed a lack of information regarding feeding stuffs. While most candidates knew how to find the price per food unit of a feeding stuff, many were unable to define the term "food unit."

Other candidates had never been on an experimental farm, although in at least one instance there was a farm attached to the Institution at which the students had been taught. In spite of these defects, however, it is satisfactory to note that the candidates were on the whole better prepared than in the two or three preceding years.

AGRICULTURAL BOTANY. (300 Marks.) Prof. John Percival, Sc.D.

The average marks obtained in this subject were good, but many candidates gave evidence, both in the paper and the oral examination, of a low standard of instruction on the practical side.

Many had never examined ears of rye, barley, wild oat, or the flowers, fruits and seeds of most of the common farm weeds.

While most were able to give correct *names* to the specimens of grasses, they were unable to give any intelligible account of the diagnostic characters of the grass inflorescences, and few gave accurate descriptions of the seedlings of mangel, carrot, red clover and other common farm plants.

The biennial crops (e.g., turnips, mangel, cabbage) were only known to most in the first year of their growth, the stems and leaves developed in the second year, with the inflorescences, flowers and fruits, never having been seen.

Knowledge of the fundamental physiological processes of plants was often hazy, respiration being confused with carbon assimilation, and nitrification with nitrogen-fixation.

More time should be devoted to practical work in this subject than appears to be done at most centres where the candidates are trained.

AGRICULTURAL BOOK-KEEPING. (200 Marks.) C. S. Orwin, M.A.

The general average of the work done in this paper was distinctly good, and it is evident that the subject of farm accountancy is receiving more attention. Very few candidates showed any lack of knowledge of principles and most of those who lost marks did so through carelessness, bad arithmetic or slowness.

AGRICULTURAL ZOOLOGY. (200 Marks.) John Rennie, D.Sc.

The percentage of passes may be regarded as, on the whole, satisfactory. About one-fourth of the candidates obtained 75 per cent or over, but an almost equal number were near the border line, and the proportion of passes at this level was too high. Deficiencies were in great measure due to the following causes: The standard of knowledge of systematic entomology was too elementary and not up to that prescribed in the syllabus. Too many candidates came forward without practical experience of field problems, even in a limited degree, and this was reflected in their suggestions for control measures which in many cases were totally impracticable. The inclusion of field demonstrations in the courses of instruction, wherever practicable, is strongly recommended.

VETERINARY SCIENCE. (200 Marks.) Prof. Sir John McFadyean, M.B., B.Sc., C.M.

The standard of knowledge displayed by the candidates was fairly satisfactory, and only about 20 per cent of them failed to obtain pass marks.

9. The thanks of the Board are again due to the authorities of the University of Leeds, for their liberality and courtesy in placing the Great Hall and other rooms of the University at the Board's disposal for the Examination; and to the Examiners, for the care and attention they bestowed upon the written answers to the papers set, and upon the *viva voce* examination.

ERNEST MATHEWS,

Chairman.

16 Bedford Square, London, W.C.1.
April, 1923.

II.—REPORT ON THE RESULTS OF THE TWENTY-EIGHTH EXAMINATION FOR THE NATIONAL DIPLOMA IN DAIRYING, 1923.

1. The Twenty-eighth Annual Examination for the National Diploma in the Science and Practice of Dairying was, by the courtesy of the Authorities, held for English candidates at the University College and British Dairy Institute, Reading, from September 7 to 15; and for Scottish candidates at the Dairy School for Scotland, Kilmarnock, from September 21 to 29.

2. Seventy-two candidates presented themselves at the English Centre. Of these, sixty appeared for the first time, while the other twelve, having failed last year in a portion of the examination, were permitted to take that portion again on the present occasion. Six candidates attained the "Honours" standard and forty-one others were awarded the Diploma:—

ENGLISH CENTRE.

Diploma with Honours.

1. EDWARD CAPSTICK, British Dairy Institute, Reading.
2. AILEEN MARJORIE DAVIDSON, British Dairy Institute.
3. WILLIAM EDWARD COLE, British Dairy Institute.
4. BRIAN JOHN FRICKEE, British Dairy Institute.
5. JOHN CECIL WILLIAM SIMMS, British Dairy Institute.
6. BESSIE WALL, Midland Agricultural & Dairy College, Kingston, Derby.

Diploma.

- AGNES DOROTHY AINSLIE, British Dairy Institute.
 M. BEATRICE ARCHER, Midland Agricultural & Dairy College.
 LAURENCE HENRY BEARD, British Dairy Institute.
 MILLICENT NELLIE BLACKMAN, British Dairy Institute.
 GEORGE RANDLE BLACKSHAW, East Anglian Institute of Agriculture, Chelmsford.
 FRANCES BURGE, British Dairy Institute.
 WINIFRED MARIAN COOKE, British Dairy Institute.
 WINIFRED COX, British Dairy Institute.
 ALICE DAVIES, British Dairy Institute, and East Anglian Institute of Agriculture.
 ANNIE DAVIES, British Dairy Institute.
 MARY WYATT EARLE, British Dairy Institute.
 MARJORIE EDITH FENTON, British Dairy Institute.
 MARY FIELDING, Lancs C.C. Dairy School, Hutton, Preston.
 PHYLLIS WEST FIRTH, Lancs C.C. Dairy School.
 ALAN VERE BLAGDEN FOSTER, Midland Agricultural & Dairy College.
 BERYL GARRARD, Studley College, Warwickshire.
 GWEN GLYNN-JONES, University College of Wales, Aberystwyth.
 ROBERT JOSEPH HINTON, British Dairy Institute.
 EDITH MARGARET JONES, British Dairy Institute.
 ELIZABETH B. MCTURK, British Dairy Institute.
 MARGUERITE OLIVE MARSHALL, British Dairy Institute.
 GWILYM TREVOR MORGAN, University College of Wales, Aberystwyth.
 W. DONALD MOSS, Dairy School, Kilmarnock, and British Dairy Institute.
 MARGARET FRANCES NOWELL, British Dairy Institute.
 JOHN MOSLEY PECK, Midland Agricultural & Dairy College.
 ALICE H. FILKINGTON, Lancs C.C. Dairy School.
 CHRISTOPHER FELL PORTEOUS, British Dairy Institute.
 ALBERT WYLLIE PUNTER, British Dairy Institute.
 ERIC REA, British Dairy Institute.
 NESTA COOKE ROBERTS, British Dairy Institute.
 LUCY MARY SIMPSON, Studley College, Warwickshire.
 JACK SOLOMON, Midland Agricultural & Dairy College.
 ERNEST BROWNSON STEVENSON, Midland Agricultural & Dairy College.
 BERNARD EDGAR SWAIN, Midland Agricultural & Dairy College.
 LILY JANE SWINNERTON, British Dairy Institute.
 RHONA MARGARET TABOR, Lancs C.C. Dairy School.
 INA MURIEL BOILEAU VINCENT, Lancs C.C. Dairy School.
 CHARLES ROBERT MATTHEW WEBB, Midland Agricultural & Dairy College.
 DOROTHY WHITTINGHAM, East Anglian Institute of Agriculture.
 ERNEST A. G. WIGGINS, Midland Agricultural & Dairy College.
 EILEEN GRAHAM WOODCOCK, Lancs C.C. Dairy School.

3. At the Scottish Centre there were forty-eight candidates. Forty of these took the whole examination; and eight who had previously passed part of the examination were allowed to appear this year for the remaining portion. Thirty-seven candidates succeeded in satisfying the Examiners, five of them gaining the Diploma with Honours:—

SCOTTISH CENTRE.

Diploma with Honours.

1. CLIFFORD DENT OXLEY, Wellow House, Wellow, near Bath.
2. JOHN ALGIE, Troyholm, Kilm, Argyllshire.
3. JOHN MCGREGOR, Losserslin, Lanark.
4. RODERICK DAVID MACKAY, Maryfield, Carluko.
5. HERBERT BARCHAM GREEN, The Godlands, Maidstone, Kent.

Diploma.

- DONALD CLAUDE BOWER, Seale Hayne Agricultural College, Newton Abbot, Devon.
- ABRAM BROADFOOT, Nether-Cairn, Kirkconnel, Dumfriesshire.
- GEORGE VINCENT BROWN, 52 Woodlands Road, Aigburth, Liverpool.
- A. WILSON BURT, 184 High Street, Kirkcaldy.
- GEORGE DAVIDSON, Ardencraig, Craigmore, Bute.
- THOMAS DONALDSON, 1 Willowbrae Avenue, Edinburgh.
- MARY P. EBDON, West Farm, Fulwell, Sunderland.
- DOUGLAS HUNTER FINDLAY, Stanhope, Broughton, Peeblesshire.
- FRANCES A. GARDEN, Aulton, Cruden Bay.
- ANNIE IRONSIDE, Southfield, New Deer.
- ROBERT KINLOCH, 103 High Street, Kirkcaldy.
- JOHN LOGAN, 18 Merchiston Place, Edinburgh.
- MARY MACARTHUR, Boghole, Auldearn, Nairn.
- ANNIE C. MCCLEMENTS, Schoolhouse, Sandystones, Ancrum.
- IAN SOMERLED MACDONALD, Auchengoil, Douglas Pier, Loch Gail, By Greenock.
- ROBERT ELDER KERR MACINTYRE, Bank Buildings, Long Row, Campbelltown.
- DONALD MCKENZIE, The Schoolhouse, Inchparks, Stranraer.
- LESLIE DAVID CHRISTIE McLEES, 70 Norse Road, Scotstoun, Glasgow.
- DAVID OGILVY MARSHALL, The Sheiling, Irvine Road, Kilmarnock.
- ROBERT SMITH MARSHALL, The Manse, Motherwell.
- PHYLLIS H. M. MELVILLE, Northbank Farm, Errol.
- PHILIP DENNIS MORCOM, Stuart House, Liskeard, Cornwall.
- GODFREY FREDERICK VAUGHAN MORGAN, Hillside, Galton Road, Westcliff-on-Sea.
- ALEXANDER FINDLAY REID NISBET, 122 University Avenue, Glasgow.
- ROBERT T. PATERSON, Ravenslea, East Kilbride.
- ALEXANDER PATON, 49 Colt Terrace, Coatbridge.
- DOROTHY POWELL, Wigton Hall, Wigton.
- ARTHUR WILLIAM REID, 7 York Place, Carlisle.
- MARGARET ELLA REID, 50 Dudley Gardens, Leith.
- HENRIETTA MAY SPEIRS, Marchwell, Penicuik.
- ROBERT STEWART, 34 Dalrymple Street, Girvan.
- BLODWYN M. WILLIAMS, Craig, Cwmcarne, Newport, Mon.

All the candidates at the Scottish Centre had been students at the Kilmarnock Dairy School.

4. The Examiners at both Centres were: William Burkitt,

B.Sc., F.H.A.S., N.D.D. (General Dairying, Practical Butter-making and Capacity for Imparting Instruction); John Benson (Cheese-making); and J. F. Tocher, D.Sc., F.I.C. (Chemistry and Bacteriology).

5. Mr. Burkitt reports as follows: "The great increase in the number of men taking the Examination was remarkable, and the result in the subjects in which I examined was a higher average standard. The number of candidates gaining honours was satisfactory, but noticeable weaknesses were the ignorance of the composition of well-known dairy feeding stuffs, and once again a very poor understanding in many cases of the anatomy and physiology of the cow. In most cases the students evinced capability of being able to impart instruction, but whilst the average standard of the butter-making was satisfactory, there were very few really first-class candidates in this branch. The arrangements as usual were most satisfactory for the Examiners and for the students too, so far as I observed."

6. In his report on the work of the candidates, Mr. Benson says: "Taken as a whole, the results of this year's examinations were eminently satisfactory in my section at both the English and Scottish Centres. Never have we had such a large number of candidates, and the accommodation at Reading was taxed to its utmost; yet, notwithstanding this, everything went smoothly and well and each candidate was given a fair chance of exhibiting his or her knowledge and skill in the manufacture of cheese.

"In the written and oral examinations the answers given were generally above the standard of recent years and the percentage of passes was higher. The only exception to this was amongst several candidates who had failed in previous examinations for the N.D.D., either wholly or in part, and who came up again this year. In some instances these candidates failed again—and even failed to reach the standard of marks awarded to them in other years. It is difficult to explain why this should be so, but it occurs at almost every examination. I was pleased to note at Reading, where the candidates are drawn from a number of teaching centres, a great improvement both in the theory and practice of candidates who had been trained at certain institutions whose pupils in recent years have consistently failed to distinguish themselves when the final results have been tabulated.

"I remarked in my report last year that many candidates were lacking in a general knowledge of the construction and use of modern dairy machinery, and I am afraid the same remarks apply this year, though perhaps to a lesser extent. This is rather a serious defect and should be remedied. With the great advances which are now taking place in dairying and the extended use of machinery in connection with the work, I am of opinion that more attention on the part of instructors

needs to be given to impart to students up-to-date information on the equipment of modern dairies and factories and on the construction and working of dairy machinery now in general use.

"In the actual practice of cheese-making most of the candidates were skilled and obtained marks well above the number required for a pass. The work of candidates at the Scottish Centre was particularly uniform and good. At Reading the practice was not so uniform, but naturally one expected this, seeing that the candidates at this centre were sent up by a number of colleges. This being the case, there must necessarily be variations in the actual process of making cheese according to the demands of local markets. However, the methods of making cheese generally, as practised at all the schools, have recently been greatly improved. This is satisfactory.

"The arrangements for the supply of milk for cheese-making purposes and the general arrangements for carrying out the examinations were this year, as usual, most complete."

7. Dr. Tocher reports that "There was only a slight improvement in the state of preparedness of the candidates who reappeared for examination. The candidates generally showed a fairly full knowledge of the technical branches of chemistry. Their knowledge of general elementary chemistry however still remains of an inadequate character and the same is true with regard to the average student's knowledge of the general principles of chemistry. One must conclude that the candidates had had no proper elementary training or that there had been no recent preparation by them in this branch of the examination. This was more conspicuous in England than in Scotland. The knowledge of general bacteriology was however much fuller at the Reading centre than at Kilmarnock. The capacity and degree of preparedness of the candidates of the two centres may be classified as follows: *Inadequate or poor*, Reading 21 per cent., Kilmarnock 17 per cent.; *Passable*, Reading 56 per cent., Kilmarnock 62 per cent.; *Good*, Reading 16 per cent., Kilmarnock 21 per cent.; *Excellent*, Reading 7 per cent., Kilmarnock 0 per cent. Most of the candidates possessed a sound knowledge of the principles of laboratory methods and were able to use the microscope in examining organisms submitted to them for their comments. It was a surprising fact to find a fairly large percentage of candidates in ignorance of the method by which atmospheric pressure can be determined. Most of the candidates showed a good knowledge of the composition, nature and properties of the chemical substances met with in dairying."

ERNEST MATHEWS, *Chairman*.

T. B. TURNER, *Secretary*.

16 Bedford Square, London, W.C.
October, 1923.

ANNUAL REPORT FOR 1923 OF THE PRINCIPAL OF THE ROYAL VETERINARY COLLEGE.

ANTHRAX.

The following Table shows the number of confirmed outbreaks of anthrax in each of the past eight years:—.

Year.		Outbreaks.		Animals attacked.
1916	..	571	..	687
1917	..	421	..	480
1918	..	245	..	282
1919	..	234	..	314
1920	..	459	..	547
1921	..	515	..	849
1922	..	515	..	603
1923	..	721	..	841

As pointed out in previous reports, the remarkable decline in the number of outbreaks which began in 1917 and continued till 1919 must be attributed to the reduced amount of infected feeding stuffs and manures imported at that time owing to the interference with shipping, and the gradual increase in the number which began in 1920 was foretold. The incidence of the disease is now approximately what it was in 1912, in which year the number of confirmed outbreaks was 743; and no notable reduction is to be expected in the future unless circumstances should again reduce the amount of infected materials introduced from abroad.

Although it is very likely that some outbreaks in this country have been caused directly by anthrax spores present in manure made from imported bones, it has never appeared probable that more than a small fraction of the whole had that origin, and the figures shown in the table point in that direction. One may assume that the rise or fall in the number of cases of the disease which result from the consumption of infected foreign food materials must nearly coincide in point of time with any marked fluctuations in the amount of such substances imported; or, in other words, that the effect either way would show itself almost immediately, since these substances are consumed soon after they reach this country. There would, on the other hand, be no reason to expect a similar time relationship between the importation of infected manure and the occurrence of the cases caused by it, for when manure is applied to land that is being cropped its effect might be delayed for a considerable time, and would probably be more lasting. The comparatively sudden fall in the number of cases of the disease in 1917-18, and the equally

sudden rise in 1919-20, thus appear to support the view that imported bone manure is not responsible for any considerable proportion of the outbreaks of anthrax in this country.

GLANDERS.

The following Table shows the number of outbreaks and the number of horses attacked in each of the last nine years:—

Year.		Outbreaks.		Animals attacked.
1915	..	50	..	87
1916	..	47	..	117
1917	..	24	..	62
1918	..	34	..	98
1919	..	25	..	61
1920	..	15	..	22
1921	..	11	..	42
1922	..	4	..	4
1923	..	8	..	13

In the report for 1922 the fact that the disease had not been eradicated was said to be disappointing, and it is doubly disappointing to find that there was actually a slight increase in the number of outbreaks during 1923. In order to be able to appreciate the present position with regard to the disease, it ought to be remembered that as recently as 1910 there were no fewer than 351 outbreaks with 1,014 animals attacked, and also that in what is called the occult form of the disease a horse may not show any obvious symptom that he is infected for years. Another fact that tends to make the final eradication of the disease difficult is that horse-owners are becoming less familiar with the symptoms that ought to awaken suspicion, with consequent danger of delay in reporting.

SHEEP SCAB.

The reported outbreaks of this disease in each of the last eight years was as follows:—

Year.	Outbreaks.
1916	381
1917	543
1918	351
1919	438
1920	479
1921	757
1922	683
1923	646

In many previous reports the opinion was expressed that sheep scab would never be eradicated without further strengthening of the law in regard to the penalties for concealment of the disease, and on various occasions the Society has pressed that view on the Ministry of Agriculture. Partial effect has been given to those representations in the Sheep Scab Order,

1923 (see Report to the Annual General Meeting, page 321); but, as that did not come into force until June 30, and one of its important provisions will not operate till July, 1924, it is not yet possible to forecast its results. It must be noted, however, that it has so far failed to make any impression on the disease, for while, as compared with the corresponding period of 1922, there were forty-two fewer outbreaks in the first half of the year, there were three more outbreaks in the second half, during which the new Order was in operation, and the usual wide dissemination of the disease occurred in the autumn months.

SWINE FEVER.

The number of confirmed outbreaks of this disease in each of the last nine years was as follows :—

Year.		Outbreaks.
1915	..	3,994
1916	..	4,331
1917	..	2,104
1918	..	1,407
1919	..	2,305
1920	..	1,816
1921	..	1,286
1922	..	1,390
1923	..	1,963

The history of swine fever since it was first scheduled as a contagious disease falls into three periods.

The first was from 1879 to 1893, during which the disease was dealt with by the local authorities. During this period the reported outbreaks showed large and unaccountable fluctuations; for example, in 1884 they were 1,877, and in the following year they had risen to 7,926. After fluctuating between seven and five thousand during the following six years, they fell to 2,748 in 1892. No concerted effort was made to control the disease during this period, and in one year (1887), 41,973 swine were attacked and the outbreaks were distributed over seventy-one counties.

The second period began in November, 1893, and terminated in 1916. In the first of these years the control of the disease was taken over by the Board of Agriculture, and measures intended to eradicate it were put into force, both diseased and suspected or in-contact pigs being slaughtered and compensation paid to the owners. The outbreaks during this time are not strictly comparable with those of the first period, because diagnosis was now more accurate, and no doubt fewer outbreaks remained unreported. In the first complete year of this period (1894), the confirmed outbreaks numbered 5,682, and by 1905 they had fallen to 817 and the extinction of the disease appeared to be in sight. Unfortunately, they began to increase in the

following year, and in 1916 they had risen to 4,331. The slaughtering-out policy of this period was enormously expensive, and, as it appeared to hold out no prospect that it would succeed in eradicating the disease, it was abandoned, apparently with the approval of the owners and breeders of pigs, and indeed largely at their instigation.

The third period began in 1916, when compulsory slaughter was abandoned in favour of the policy which has since been pursued. Under that, suspected but apparently healthy pigs are not compulsorily slaughtered, and owners are encouraged to use anti-swine-fever serum to bring an outbreak to an end. The effect of this method of dealing with the disease can be judged from the above table, the most disquieting feature of which is the great increase in the number of outbreaks during 1923. There is no obvious explanation of this increase, but the most probable appears to be that the obligation which the law lays on owners to report the suspected evidence of the disease is now being more frequently evaded. It ought to be noted that, in spite of its apparent popularity with owners, at least at the outset, it was clear that the new method would in most cases not work out to their direct advantage, since each had to stand the loss occasioned by the disease among his own pigs. Compared with the present method, the one which it replaced was much better from the owner's point of view, since it amounted to a system of insurance against swine fever under which he paid no premium. It was easy to foresee that the attempt to prevent the spread of the disease by the use of serum could not be as effective as the slaughtering-out method, and therefore could not be expected to eradicate the disease when the latter had failed, but it is disappointing to find in last year's results evidence that it may even fail to hold the disease in check.

PARASITIC MANGE IN HORSES.

The incidence of the disease during the last six years is shown in the following Table :—

Year.	Outbreaks.	Animals attacked.
1918 ..	4,483 ..	8,377
1919 ..	5,016 ..	9,861
1920 ..	3,564 ..	3,812
1921 ..	2,055 ..	3,108
1922 ..	1,035 ..	1,454
1923 ..	786 ..	1,115

It is satisfactory to find that there has been a decline in the number of outbreaks as compared with the previous year, and that the disease is now not only less prevalent than it was during the war period, but actually less than it was before 1914.

SWINE ERYSIPELAS.

It is probable that this disease is a very old one, and it is quite possible that it may have existed in this country centuries ago. It is, however, not to be identified with certainty in the old literature, and even as recently as about 1890 it appears to have been confounded with swine fever. It is the principal pig plague of many Continental countries, and in Germany, where it is a notifiable disease, it has long been the cause of serious losses. In some of the years before 1915 in that country as many as 80,000 pigs were attacked, with a mortality of over 60 per cent. In France the disease was equally extensive and fatal.

That the disease is not at all rare in this country was first discovered when the Board of Agriculture began to deal with swine fever, and organs from suspected pigs had to be sent to the Board's Laboratory for a diagnosis. In a considerable proportion of cases the examination of such organs showed disease of the valves of the heart, which is common in the more chronic cases of swine erysipelas. In 1897 important information regarding the occurrence of the disease in the United Kingdom was furnished in a Report of a Departmental Committee appointed "to enquire into the diseases classed as swine fever," and more recently the disease has been dealt with in reports of the Chief Officer of the Ministry of Agriculture and Fisheries.

The cause of the disease is a minute bacillus, which in acute cases is found in large numbers throughout the blood, and in the more chronic cases is confined to the lesions. The bacillus is easily cultivated outside the body and grows well at summer temperatures. Artificial cultures of the bacillus can be employed to infect pigs with fatal effect.

In its acute form swine erysipelas is a very serious disease, causing from 60 to 80 per cent. of deaths among the animals attacked, and the period of visible illness may not be more than twenty-four to forty-eight hours. In these cases the temperature is elevated, food is refused, and frequently a diffuse red discoloration of the skin appears, either all over the body or confined to some particular part, such as the under surface of the neck or inside the thighs.

In a milder form of the disease a peculiar eruption develops on the skin, in the shape of sharply circumscribed elevations, which in white pigs have a dark red or violet colour. These skin lesions may have a diameter of 2 in. or more, and frequently they have a four-sided or diamond shape.

In the most chronic form of swine erysipelas the post-mortem examination may show no alterations except in the valves of the heart. It has long been known that a considerable pro-

portion of pigs that survive an acute or sub-acute attack afterwards die suddenly from this form of heart disease, but in this country such heart lesions are often found to have been the cause of death of pigs reported never to have suffered from any illness.

Although, as previously stated, the disease was long confounded with swine fever, there is in the great majority of cases no difficulty in distinguishing between the two diseases.

In the first place it may be stated that the peculiar skin eruption previously referred to is never seen in swine fever, although a diffuse redness of the skin may be. Post-mortem examination in a case of swine fever generally shows quite characteristic ulcerative or diphtheritic lesions in the large intestine. In the acute form of swine erysipelas there is always more or less distinct gastritis and inflammation of the intestines, but that is frequently confined to the small intestine and is never ulcerative. Swine erysipelas is comparatively rare among pigs under two or three months old, but swine fever is common among pigs of that age. In acute cases of swine erysipelas a diagnosis can always be made by microscopic or cultural examination of the blood.

Swine erysipelas is a contagious disease, and the general view of it hitherto held on the Continent is that it spreads almost exclusively by contagion. The facts with regard to the occurrence of the disease in this country, however, do not support that view, but on the contrary suggest that the bacillus which is the cause of it is in many places a normal or constant inhabitant of the soil.

The disease varies greatly in frequency in different parts of the country, the eastern counties furnishing the largest number of cases in proportion to their pig population.

The disease also shows a remarkable seasonal occurrence, the months of July, August, and September being the period in which most outbreaks occur. This would be difficult to explain if the disease were spread solely by contagion, but, on the other hand, it is quite in keeping with the view that pigs in many cases become infected frequently from the soil; and the fact that more cases occur in the months mentioned can be explained by the higher temperature at that time being favourable for the multiplication of the bacilli.

It is, however, important for owners to remember that when once started in a lot of pigs the disease undoubtedly tends to spread from one to the other by contact, and also that the purchase of an infected pig may introduce the disease into a stock previously healthy.

Within recent years a system of inoculation against the disease has been practised on a very large scale in France, Ger-

many, and other Continental countries. The method involves the simultaneous use of what is called a protective serum and an artificial culture of the bacillus of swine erysipelas. The operation is carried out on young pigs, and it is reported to have greatly reduced the mortality of the disease where it has been applied.

In this country, where pigs are valuable, it would probably be better, when an outbreak occurs, to treat the whole of the healthy animals with a sufficient dose of serum alone, as the combined method in which artificial culture of the bacillus is also given involves a certain risk. The injection of serum gives a valuable protection for two or three weeks, and if necessary a second dose can be given.

When an outbreak occurs it is also advisable to remove the pigs from styes and give them frequent change of ground on a field where pigs have not previously been kept, and at this time the styes should be thoroughly cleansed and disinfected.

FOOT-AND-MOUTH DISEASE.

During the first month of 1923 no fresh outbreak of foot-and-mouth disease was confirmed, but in the first fortnight a number of animals were destroyed which had been exposed to infection at two places in the county of Glamorgan, where outbreaks had occurred in the last days of 1922.

The first fresh outbreak occurred in Chester in the week ended February 3, and the second in the same county in the following week. Up to the end of April only five further outbreaks had been confirmed, of which two were in Gloucester in February, one in Derby in March, and one each in Norfolk and Essex in the following month.

All these outbreaks appeared to have been dealt with successfully, and for a period of eight weeks following the one confirmed in Essex at the end of April no fresh case of the disease was reported. This period of apparent complete freedom from the disease was terminated by the occurrence of two outbreaks in the last fortnight of June, both in York East Riding. These also appear to have been successfully dealt with by slaughter, as no further case was reported from that county until the last week of October.

In July and August the reported outbreaks were in the following counties: Bedford, 17; Surrey, 2; Southampton, 9; Lancaster, 2; York West Riding, 1.

Up to September 1 the total confirmed outbreaks numbered 40, and in connection with them 1731 animals had been destroyed as diseased or exposed to infection. From that time onwards the disease assumed an aspect of steadily increasing gravity, owing to the occurrence of independent outbreaks in widely

different parts of the country, and apparent failure of slaughter to arrest the spread of infection around particular centres. By the end of the year the number of outbreaks had increased to 1756, and the number of animals slaughtered as diseased or suspected was 60,478. In respect of the number of outbreaks the past year has thus been the worst since 1883, when 18,732 outbreaks were reported and over half a million cattle, sheep and pigs were attacked with the disease.

Although during the last four months of the year outbreaks occurred at widely different parts of the country, the great majority were located in the following four areas.

The first and most serious of these included the counties of Cheshire, Salop, Lancaster, Flint, Denbigh, Worcester, and Derby, and of this area Cheshire appears to have been what may be called the "storm centre," although, as the following table will show, it is possible that that county owed its infection to an independent outbreak in Lancaster in the week ended September 1.

TABLE I.

	Chester.	Salop.	Lancaster.	Flint.	Denbigh.	Worcester.	Derby.
3-2 . . .	1	—	—	—	—	—	—
18-2 . . .	1	—	—	—	—	—	—
10-3 . . .	—	—	—	—	—	—	1
1-9 . . .	—	—	2	—	—	—	—
8-9 . . .	4	—	7	—	—	—	—
15-9 . . .	14	1	2	—	—	—	—
22-9 . . .	4	2	1	—	—	—	—
29-9 . . .	2	3	1	—	—	—	—
6-10 . . .	—	2	2	6	—	—	—
13-10 . . .	—	2	2	—	—	—	—
20-10 . . .	—	3	1	2	—	—	—
27-10 . . .	1	2	1	2	5	—	—
3-11 . . .	3	4	—	5	6	—	—
10-11 . . .	16	5	—	3	9	—	—
17-11 . . .	35	3	1	5	11	4	—
27-11 . . .	60	2	5	2	9	—	—
1-12 . . .	99	7	2	3	13	2	1
8-12 . . .	140	13	5	4	8	1	2
15-12 . . .	200	19	5	6	1	5	3
22-12 . . .	190	22	9	12	8	5	1
29-12 . . .	212	20	12	6	3	2	5
Totals . . .	982	110	58	56	73	19	12

The second centre was in York West Riding. There had been two outbreaks in the East Riding in the last fortnight of June, but these were apparently dealt with successfully, as there

was no further outbreak there during July, August, or September. The first outbreak in the West Riding in 1923 occurred in the last week of August, and that was apparently the starting point of a series which at the end of the year amounted to seventy-nine outbreaks. During the same period three outbreaks occurred in the East Riding and fifteen in the North Riding.

TABLE II.

	York W. Riding.	York E. Riding.	York N. Riding.
1-9	1	—	—
6-10	2	—	—
13-10	11	—	—
20-10	10	—	—
27-10	9	1	—
3-11	3	—	—
10-11	2	2	—
24-11	2	—	—
1-12	13	—	4
8-12	5	—	—
15-12	3	—	1
22-12	7	—	3
29-12	6	—	7
Totals	79	3	15

The third important group of outbreaks in England was in Northumberland and Durham, and the sequence of events in these two counties till the end of the year is shown in the following table.

TABLE III.

	Northumberland.	Durham.
24-11	2	1
1-12	25	38
8-12	9	24
15-12	12	14
22-12	7	5
29-12	4	2
Totals	59	84

The fourth series of outbreaks (but the third in point of time) occurred in Scotland. The first outbreak was reported in Ren-

frew, and 100 others, distributed in nine counties, were confirmed before the end of the year. The table shows the order in which they occurred.

TABLE IV.

	Ren- frew.	Lan- ark.	Fife.	Dum- barton.	Stir- ling.	Aber- deen.	Perth.	Ayr.	Kin- ross.
27-10 .	1	—	—	—	—	—	—	—	—
3-11 .	3	1	1	—	—	—	—	—	—
10-11 .	9	1	—	4	3	—	1	—	—
17-11 .	2	2	—	1	3	—	3	—	—
24-11 .	4	3	—	11	—	1	—	1	—
1-12 .	2	2	—	3	4	1	—	1	1
8-12 .	3	2	—	1	—	1	1	—	—
15-12 .	—	7	1	3	—	—	—	2	—
22-12 .	—	1	—	1	1	—	—	—	—
29-12 .	1	3	2	—	2	—	—	—	—
Totals	25	22	4	24	13	3	5	4	1

Without fuller knowledge than has yet been made public by the Ministry of Agriculture it would be futile to attempt to determine on how many occasions, if any, during the year under review the virus of the disease was brought from abroad and established a fresh footing in this country. During the first ten months of the year, however, the occurrence of outbreaks at widely separated parts of England made it probable that the disease had this exotic origin in a considerable number of cases. Outbreaks that were thus disconnected in locality, and also in time, occurred in Norfolk, Essex, York East Riding, Bedford, Southampton, Buckingham, Devon, Lincoln, Surrey, and Somerset. On the other hand, there is no reason to doubt that all the outbreaks which occurred in the last four months of the year in the first three of the before-mentioned centres and the fringes around them may have been quite independent of any fresh introduction of the disease from abroad. It is therefore necessary to seek for an explanation of the failure of stamping-out measures to stay the spread of the infection at so many centres during the past year, notwithstanding the fact that identical means have on numerous occasions since 1892 promptly effected the eradication of the disease.

In dealing with the question it must at the outset be observed that, owing to the supremely contagious character of the disease, even such a radical procedure as slaughter of visibly diseased animals and of those known to have been exposed to contagion is almost foredoomed to failure unless the slaughter is carried

out very soon after the disease has broken out. That is another way of saying that prompt notification of the existence of the disease is a prerequisite of success. If notification is delayed at any place other than one in which the affected animals are separated by a considerable distance from other cattle, sheep, or swine, the slaughter may be too late, because in the interval the virus may have been carried to the adjacent farms by human beings or animals, or even by the air.

In the second place it should be noted that the difficulty of dealing with the disease is proportional to the density of the animal population in the district where it breaks out, especially when there is any delay in notification, since the outbreaks tend to multiply in geometrical progression and the number occurring in a short time may make prompt isolation and slaughter almost impossible.

Finally, it is obvious that the most formidable obstacle to extinction of the disease at any place is the sending of animals that are known or suspected to have been exposed to contagion for sale at a public market.

When account is taken of these considerations, there is no difficulty in understanding the rapid extension of the disease in the latter part of the year, especially in the area of which Chester and Salop form the centre. In these two dairying counties the cattle population is exceptionally dense, and facilities for the spread of the disease from farm to farm are at their maximum. There is also reason to suspect that the outbreaks which occurred in Chester in the month of September were the direct outcome of concealment or failure to recognize the disease in one lot of animals that were sent to a particular market.

The series of outbreaks which occurred in the north of England in the last six weeks of the year is known to have been started by pigs forwarded to Newcastle from a farm in Aberdeenshire on which the disease existed but was not notified. Table III is particularly interesting because it affords a striking warning of the consequences of concealment of the disease.

The outbreak which occurred in Renfrew in the last week of October was the first in Scotland for the year. No connection between that and any of the outbreaks in England or Wales could be discovered, and it may have had an independent origin through the introduction of the virus from abroad. It is probable that if the facts were known all the succeeding outbreaks in Scotland could be traced back to it.

The costly character of the stamping-out method during the past year has naturally raised doubts as to the justification of that policy, but not among those who are well acquainted with the history of the disease in this and other countries. All past experience indicates that any attempt to deal with it by isolation

without slaughter would have failed, with resulting losses similar to those which the disease has recently inflicted throughout nearly the entire continent of Europe, and far exceeding anything that this country has suffered from the same cause during the last forty years.

**JOHN'S DISEASE, QUARTER EVIL, AND CONTAGIOUS ABORTION
IN MARES.**

These diseases are at present under investigation in the Research Institute at the College, and members of the Society who desire to be advised with regard to them are invited to apply to the Principal.

J. MCFADYEAN.

Royal Veterinary College,
London, N.W.1.

**ANNUAL REPORT FOR 1923 OF THE
CONSULTING CHEMIST.**

THE number of samples (406) analysed for Members during the year was considerably less than in 1922, when there was an increase of about 100 on the figures of 1921, the number for the year 1923 having fallen somewhat short of that for 1921 (448).

In addition, 13 samples of Cider, in connection with the Newcastle Show, were analysed.

It can hardly be said that any particularly new feature has presented itself during the year as regards samples sent for analysis.

Linseed, Cotton and similar Cakes have been, speaking generally, quite satisfactory, and there was also an improvement as regards the purity of different cereal offals. But few cases have occurred in which useless or injurious ingredients have been found to be present in feeding stuffs, and nothing further has been heard of the occurrence of Castor Oil Bean in Compound Cakes and Meals, one which gave rise to so much trouble last year. These occurrences would seem to be sporadic in nature, and one cannot resist the conclusion that they are coincident with a certain laxity as regards watchfulness against their possible presence in imported goods.

While manufactured Cakes have been somewhat high-priced, fertilisers have been correspondingly cheaper. There is little doubt, for instance, that, because of foreign competition, Superphosphate has not "paid," in this country, for the making;

supplies of Potash Salts of different kinds have also been very cheaply obtained. Basic Slag, in spite of predictions as to the difficulty of getting good quality samples, has been fairly plentiful, and by no means necessarily of low quality. A good deal of attention has been directed, and very properly so, to the fineness of grinding. This also applies to ground Mineral Phosphates, the use of which—and chiefly the North African Phosphates—has come in considerably of late. This North African Phosphate has, indeed, been about the only new thing on the fertiliser market.

A fair number of samples of water have been analysed, but analysis of soils has not been employed to nearly the same extent as in 1922. As then, so now, the main need of soils is found to be that of liming, and considerably more attention has been paid to the kind of lime to use for the purpose. The instances given in this report will show how necessary it is to take care as to the nature and quality of lime supplied.

Perhaps the most important event to be recorded here is that the repeated representations of this Society, and of kindred agricultural bodies in association with it in the matter, have resulted at length in the Minister of Agriculture appointing a Departmental Committee to enquire into the working of the Fertilisers and Feeding Stuffs Act, and to consider what amendment, or otherwise, of it is called for. It is sincerely to be hoped that this will result in a really good and workable Act being passed.

One other event must be recorded with regret, viz., the death of Mr. F. J. Lloyd, who was—as far back as 1883—Senior Assistant in the Society's laboratory when it was located at 12 Hanover Square. Mr. Lloyd subsequently became Consulting Chemist to the British Dairy Farmers' Association, and was well known chiefly in connection with Dairy matters and also with the scientific side of the Cider industry.

As is my usual custom, I call attention now to special cases of interest which have been brought to my notice through samples sent me by members of the Society for analysis.

A. FEEDING STUFFS.

1. *Linseed Cake.*

Commencing at £13 12s. 6d. per ton in January, the price of Linseed Cake gradually fell to £10 10s. in May, and so continued until August, when it rose again to £11 2s. 6d. in September and £12 5s. per ton in November.

The improvement which was noted last year as regards purity has been well maintained. Such samples of Linseed

Cake as I received during the year were all satisfactory in this respect. The following, however, is the case of a high-priced Linseed Cake :—

Moisture	11.45
Oil	7.78
Albuminoids	31.62
Carbohydrates	43.69
Woody fibre, &c.	5.46
¹ Mineral matter	5.46
	<hr/> 100.00
Nitrogen	5.06
¹ including Sand	4.46

This Cake cost £13 2s. 6d. delivered at Thurso, in September, 1923. It contained only 7½ per cent. of Oil, whereas Linseed Cake, guaranteed 9 per cent. of Oil, was then selling at £11 10s. per ton on rail.

2. Cotton Cakes.

The price of undecorticated Cotton Cake varied but little throughout the year, being about £7 5s. or £7 10s. per ton, and occasionally falling to £6 17s. 6d. Bombay Cotton Cake, similarly, was steady at £6 10s. per ton, the lowest figure reached being £5 16s. 3d., June-August.

The samples sent me were all of good quality and purity, and call for no particular comment.

3. Decorticated Cotton Cakes and Meals.

Prices ranged from £13 7s. 6d. per ton early in the year to £11 5s. (June-August), rising again in November to £12 5s. per ton.

Only a few samples of these have come forward, and the supply has been a very limited one. In one case submitted to me from Surrey, a sample of what had been bought as Decorticated Cotton Meal was found to consist of 20 per cent. Rice Meal, 3 per cent. Oat Husk, and 77 per cent. of Decorticated Cotton Meal. The price asked was £14 12s. 6d. per ton, and, on the purchaser making a complaint, £3 2s. 3d. was allowed him on a purchase of 1 ton 3 cwt.

Analysis.	
Moisture	9.57
Oil	5.68
Albuminoids	33.43
Carbohydrates	45.14
Woody fibres, &c.	6.18
¹ Mineral matter	6.18
	<hr/> 100.00
Nitrogen	5.35
¹ including Sand	5.59

4. Compound Cakes and Meals.

These, as a class, have been found to be generally satisfactory; nor have I found the presence of worthless or injurious ingredients in the samples submitted to me.

5. Cereals, Offals, &c.

There has been a similar improvement in these materials. The following may be of interest:—

OATMEAL SIFTINGS.	
Moisture	5.61
Oil	2.79
Albuminoids	6.75
Carbohydrates	54.33
Woody fibre, &c.	25.51
¹ Mineral matter	5.01
	<hr/>
	100.00
	<hr/>
Nitrogen	1.08
¹ including Sand and Silica	3.09

This cost £5 per ton delivered. It was quite clean and free from weed seeds, and, though the price was fully high, I should not call it excessive.

6. Fish Meal (Feeding).

It is recognised that excess of Oil in this material is likely to cause harm, more especially in feeding it to pigs and poultry. It is common practice to guarantee that there shall not be a larger percentage than 4.5 of Oil present. Such a guarantee was given in the case of a sample submitted to me by a member who had been feeding it to sows with litters of young pigs. It had been given in the proportion of 6 per cent. only, but the young pigs were reported as doing badly and had been scouring a good deal. On analysing the sample I found it to contain no less than 13.32 per cent. of Oil, together with 60.93 per cent. of Albuminoids. There is little doubt that the extra oil had been the cause of the trouble.

<i>Analysis.</i>	
Oil	13.32
Albuminoids	60.93
Mineral matter	15.47
including Sand . . . . .	.63
Salt	3.06
Phosphate of Lime	11.75

The Meal had been obtained locally at 22s. per cwt. The local vendor took it back, but, on making application to the agents for the sale of the Meal, he was informed that the only

guarantee was one of 60 to 70 per cent. of Oil and Albuminoids, separate amounts of each constituent not being given. This instance points to the necessity of insisting on having a separate guarantee of the Oil contained.

7. Miscellaneous Feeding Materials.

CHOCOLATE REFUSE.

Analysis.

Moisture	2.09
Oil	33.54
Albuminoids	6.62
Carbohydrates	54.73
Woody fibre, &c.	3.02
Mineral matter	100.00
<hr/>	
Nitrogen	1.06
including Sand	1.26

This material has been referred to in previous reports, *e.g.*, JOURNAL R.A.S.E., 1912, pp. 279-80, and 1913, pp. 367-8. The analysis is not unlike those of previous samples, and, to judge from the price asked for it, it appears to have become rather a favourite one for pig-feeding, for, whereas the price of this material in 1912 was £3 per ton, and in 1917 £7, now, in 1923, in the above instance, the price asked was £17 per ton!

B. FERTILISERS.

1. Superphosphate.

A

Moisture	13.50
Organic matter	4.94
Monobasic Phosphate of Lime	11.24
equal to	
Tribasic Phosphate of Lime	(17.61)
Insoluble Phosphate . . . . .	.98
Sulphate of Lime, &c.	33.17
Sand	36.17
<hr/>	
	100.00

B

	Per cent.
Moisture	10.04
Soluble Phosphate	22.78
Insoluble Phosphate	2.30
Sand	24.23

It is not often that there are complaints with regard to Superphosphate. Two cases, however, were reported to the Chemical Committee, both of them proceeding from the same

source in the south of England. In each case the Superphosphate (purchased from abroad) had been mixed locally with a considerable amount of sand and sent out under the guarantee of it containing 30 per cent. of soluble phosphate.

In A no less than 60 tons of this had been contracted for, and, on a sample of the delivery being analysed, it was found to contain only 17.61 per cent. of soluble phosphate with 36.17 per cent. of sand.

In the second instance (B) the amount of soluble phosphate was 22.78 per cent., and that of sand 24.23 per cent.

In each case the material was lumpy and in bad condition for sowing.

The explanation given was that the Superphosphate, which had been obtained from abroad, was, on arrival in this country, found to be of 36 per cent. quality, and the order was given to "break it down" to meet the guarantee of 30 per cent., and that the mixing had been carelessly done! The moral of this is, of course, "get your Superphosphate from Home sources and from firms of good standing."

The price of Superphosphate of home manufacture has been maintained at about £3 per ton for 30 per cent. "soluble." The above were undoubtedly cases of "underselling," as in A the price charged was 51s. 6d. per ton only.

2. *Basic Slag.*

Despite the difficulties which were expected in regard to obtaining Basic Slag of good quality, these have not been realised, for samples of quite good quality have passed through my hands, and these, with few exceptions, have been finely ground. One exception, however, may be mentioned where, in the case of a sample submitted to me, the Slag, though giving total phosphates 48.53 per cent., showed a "fineness" of only 61.2 per cent.

The prices for Basic Slag have, as with Superphosphate, been steady throughout the year—£3 2s. 6d. per ton for 30 per cent. phosphate; £4 2s. 6d. per ton for 40 per cent.

3. *Ground Mineral Phosphates.*

The following is the analysis of a material submitted to me under the name of "Fossil Phosphate":—

Moisture and water of combination	4.51
¹ Phosphoric Acid	28.66
Lime	48.31
Carbonic Acid, &c.	17.38
Insoluble Siliceous matter	1.14
	<hr/>
	100.00

¹ equal to Tribasic Phosphate of Lime 62.62

This cost 94s. per ton carriage paid for cash. Considering that the Phosphate was charged at the rate of 1s. 6d. per unit only, and that the material contained a good deal of Lime, it cannot be considered at all dear, and should be useful, particularly on land that is in need of liming.

4. Nitrate of Soda.

It is seldom that one has to complain of the presence of common salt in any quantity in Nitrate of Soda. One such instance, however, occurred in a sample of a 4-ton delivery, as much as 6.20 per cent. of sodium chloride being found on analysis.

Moisture	2.79
Nitrate of Soda	89.55
¹ Impurities	7.66
	<hr/> 100.00
Nitrogen	14.75
² including Sodium Chloride	6.20

5. Soot.

The variable quality of this has often been commented upon. The following, however, is an instance of an exceptionally good sample which came from Enfield, Middlesex :—

Moisture	8.89
¹ Organic matter and Salts of Ammonia	76.86
² Mineral matter	14.16
	<hr/> 100.00
¹ containing Nitrogen	5.86
equal to Ammonia	7.11
² including Sand	7.77

The price was £3 5s. per ton, delivered, and a bushel of it weighed 33 lb.

6. Refuse Materials.

A. HOF REFUSE.

B. POWDERED SEWAGE MANURE.

	A	Per cent.
Nitrogen		4.99
equal to Ammonia		6.05
Mineral matter		12.21
including Sand		3.33
		<hr/> N

B

Moisture	36.40
¹ Organic matter	2.61
Oxide of Iron and Alumina	7.95
² Phosphoric Acid,	1.78
Lime	23.71
Carbonic Acid, Alkalies, &c.	19.61
Insoluble Siliceous matter	7.94
	<hr/> 100.00
² equal to Phosphate of Lime	3.89
¹ containing Nitrogen . . . . .	.13
equal to Ammonia . . . . .	.16

Materials of this class are generally of very doubtful nature. Occasionally, however, as in the case of A, one worth the money is met with. This appeared to be derived mostly from hops, and was offered at £1 a ton. It contained Nitrogen 4.99 per cent., equal to Ammonia 6.05 per cent. At such a figure a material of this kind would be well worth getting.

B is an instance of the opposite nature. The material, stated to come from Leeds Sewage Works, was sold at the price of 30s. per ton on rail; the carriage to its destination was 11s. 3d. additional, making the price 41s. 3d. per ton. A liberal estimate of the value of this material would be 12s. 6d. per ton delivered.

7. *Poultry Manure.*

The following are analyses of two samples of Poultry Manure:—

A

Moisture	71.41
¹ Organic matter	21.03
Lime . . . . .	.44
Oxide of Iron, &c.	4.61
Sand	2.51
	<hr/> 100.00
¹ containing Nitrogen	1.55
equal to Ammonia	1.88

B

Moisture	9.43
¹ Organic matter	55.99
² Phosphoric Acid . . . . .	.97
Lime, Oxide of Iron, &c.	4.79
Sand	28.82
	<hr/> 100.00
² equal to Tribasic Phosphate of Lime	2.12
¹ containing Nitrogen	1.57
equal to Ammonia	1.90

A was very moist, containing, as it did, over 70 per cent. of water, and it was in bad condition for application; 30s. a ton, delivered, would appear to be about its full value.

B was offered as the material collected in a fowl-house the floor of which was covered with chaff. The manure was brought 100 miles by rail, and the price was 57s. per ton on rail. Although the material was dry and in workable condition, this had only been obtained by mixture with the chaff, which has, of course, very little manurial value, and it would seem altogether absurd to think of bringing such material a distance of 100 miles by rail.

8. Lime.

The matter of liming of land and the kind of lime to use has, very properly, exercised considerable attention. When Lime of fair quality is obtainable near at hand, it is, of course, wise to make use of such a source; but, where Lime has to be purchased and brought any distance by rail, it is very important to see that one obtains Lime of good quality, for the carriage on inferior is just as much as on good quality Lime.

The instances given below show how great may be the variations met with:—

GROUND LIME.			
	A	B	C
Oxide of Iron and Alumina.	3.16 ..	4.09 ..	11.41
Silica	8.99 ..	19.66 ..	8.04
Lime	57.60 ..	58.48 ..	51.38
Magnesia. . . . .	.67 ..	.42 ..	23.44
Moisture, Carbonic Acid, &c.	29.58 ..	17.15 ..	5.73
	<hr/> 100.00	<hr/> 100.00	<hr/> 100.00
D			
WASTE LIME.			
Oxide of Iron and Alumina	. . . . .	. . . . .	1.39
Lime . . . . .	. . . . .	. . . . .	50.15
¹ Carbonic Acid . . . . .	. . . . .	. . . . .	37.50
Silica . . . . .	. . . . .	. . . . .	.89
Water, &c. . . . .	. . . . .	. . . . .	10.07
			<hr/> 100.00
¹ equal to Carbonate of Lime	. . . . .	. . . . .	85.22
E			
CHALK.			
Oxide of Iron and Alumina	. . . . .	. . . . .	.10
Carbonate of Lime . . . . .	. . . . .	. . . . .	98.11
Magnesia . . . . .	. . . . .	. . . . .	.11
Silica . . . . .	. . . . .	. . . . .	.69
Water, &c. . . . .	. . . . .	. . . . .	.99
			<hr/> 100.00
			<hr/> <hr/>

	Per cent.
Linseed Cake	11
Cotton Cake, &c.	14
Coconut Cake	1
Compound Feeding Cakes and Meals	21
Palm Kernel Cake	8
Ground Nut Cake	7
Soya Cake	1
Cereals, Offals, &c.	33
Sugar-beet	11
Superphosphate	10
Compound Manures	5
Raw and Steamed Bones	9
Meat Meal	2
Fish Meal	7
Basic Slag	30
Slag Phosphate	2
Phosphate	8
Sulphate of Ammonia	11
Shoddy, &c.	18
Nitrate of Soda	2
Flue Dust, Soot, &c.	3
Potash Materials	10
Lime, Chalk, &c.	48
Milk, Butter, &c.	41
Water	33
Soil	31
Miscellaneous	29
	<hr/> 406

J. A. VOELCKER.

1 Tudor Street, E.C.4.

ANNUAL REPORT FOR 1923 OF THE BOTANIST.

THE seed-testing activities of the Botanist's Department have now narrowed down almost entirely to the examination of home-grown seed required for further planting—the need for testing supplies purchased from the trade having largely disappeared since the passing of the Seeds Act.

Several of the samples of clover and swede seed examined had been carried over from the previous year or years. Most of them retained sufficient vitality to be satisfactory for sowing, but one sample of swede seed described as “several years old” had deteriorated to such an extent that it was estimated that, if sown, the seed-rate would have to be about three hundred-weight per acre.

The first sample of winter oats, received early in August, provided a striking example of the difficulty which sometimes occurs in determining the germinating capacity of this seed.

A test, carried on for a period of ten days gave a germination percentage of 13—a figure which seemed far too low for a good-looking seed sample. Suspecting that further maturation would lead to a marked improvement, the remainder of the sample was placed in a warm incubator for three days and again tested with the result that 68 per cent. of the grain sprouted within five days, the rest remaining dormant.

Three weeks after the original sample was sent, a further sample was provided, every grain of which started into growth within five days.

But perhaps the chief feature of interest arising from the seed-enquiries centres round a sample of sainfoin. This was purchased from a neighbour and would never have been tested had it not been for the fact that when sown it produced an unsatisfactory plant. Then some of the remaining seed was sent for examination and found to be faulty. The buyer had been satisfied to back his own judgment—an unwise proceeding with most seeds, and particularly so in the case of sainfoin, the dull husk of which masks many of the symptoms associated with poor ripening and bad harvesting conditions. On reporting on the results of the test the suggestion was made that the figures showing the percentage of seeds capable of growing should be compared with those guaranteed by the vendor. But the buyer, though entitled to this information at the time of purchase, had not even made any demand for it.

The vendor was consequently left in the position that he could quote any figure, no matter how low, for the germination of the seed he had sold. It should be remembered that the Seeds Act applies to all sales of seed, whether by a merchant or a farmer. But farmers trading amongst themselves appear to pay as much attention to it as a motorist pays to the twenty-mile speed limit. The Act, however, is a great safeguard, and buyers, unless they are confident that they possess a faculty for judging the germinating capacity of seeds (which no man has ever yet acquired), would be well advised to take advantage of its provisions whenever making purchases.

GRASS-LAND PROBLEMS.

Enquiries for seed mixtures for the formation of permanent grass land have not been as numerous as a consideration of the condition of arable land farming would have led one to expect. But in the aggregate enquiries dealing with grass land have been distinctly more numerous than in the previous year. Most of them were concerned with the perennial problem of weed eradication, and the over-abundant growth of annuals was the commonest burden of complaint. Such a state of affairs is almost inevitable unless the most thorough cultivation can be

given to the land, but fortunately most of the annuals do far less harm than their abundance would appear to suggest. Their competition with the grass is but a temporary one, and they soon die out doing relatively little damage unless they happen to be dense enough to shade the young grass excessively.

The frequency with which specimens of grasses were sent for identification was symptomatic of consideration being given to the problems of forming permanent grass. In fact in three cases definite information was asked for as to whether seed of the species sent should be included in grass seed mixtures. A question on the methods of harvesting the seed of wild white clover was prompted by a similar reason.

CLOVER ENQUIRIES.

The clovers formed the subject matter of several interesting enquiries. The vogue for using wild white clover has led to an interest being taken in the possibility of bringing other indigenous species into cultivation. Thus two Members, both from East Anglia where the species is locally abundant, sent specimens of the perennial Sulphur clover (*Trifolium ochroleucum*) asking whether its cultivation could be recommended. The facts that it does not produce so large a bulk of herbage as cow-grass, and that the stock leave it untouched as a rule, made the proposition seem undesirable. The cultivation of that spiny-fruited pest of some pastures, the Spotted Medick, also sent from the Eastern counties, was similarly discouraged.

One other out-of-the-way species was enquired about, namely Subterranean Clover, seed of which was said to be obtainable on the market. It is common in the southern parts of this country, and very abundant in southern Europe, but its somewhat scanty herbage, its woolliness and annual habit of growth, hardly suggest that it is likely to be of value as a forage crop.

The impossible problem of distinguishing between the flowering shoots of common and giant sainfoin was provided by one enquiry. The two strains differ solely in their habit, one being a lasting perennial and the other tending to die out after the second season of growth.

That clover sickness was not so serious as usual seems to be indicated by the comparative lack of enquiries on the subject. The one case of interest was provided by the destruction of a field of kidney vetch. The crop apparently had followed red clover at too short an interval of time.

ROOTS.

Except for enquiries on diseases of swedes and turnips, the root crop has not been responsible for many questions this season. The one outstanding one has been, why are the mangels

bolting so frequently? It is still far from clear how bolting is determined. It has been ascribed to the conditions under which the seed ripened, or again to the conditions under which the crop grows—no real effort being made to define these conditions. Again it has been said to be an hereditary character, and the possibility of raising non-bolting strains has been investigated. Whatever the explanation, bolting was unusually common this season, and in one respect curious, for not only did plants with partially developed “bulbs” bolt, but seedlings with two or three small leaves, and with their cotyledons still persisting, pushed out unmistakable flowering shoots.

FUNGOID DISEASES.

With the possible exception of mosaic and leaf curl in the potato crop, plant diseases have not been unduly serious in the past season. The presence of these two still more or less mysterious troubles was, perhaps, to be expected, for the returns obtained from the crop in the previous year were not such as to lead to any considerable expenditure on a change of seed. The tendency for the number of enquiries concerning the pests of fruit trees to outstrip those concerning the staple agricultural crops, was again noticeable, and—were one to judge solely from the frequency of enquiries—the conclusion would be reached that the diseases of the wheat crop were of less importance than those of gooseberries. In the case of the former the only important disease sent in for identification was one known as “whitehead” (*Ophiobolus*). The occurrence of this disease in the country is disquieting, for though it is rarely seen in quantity sufficient to damage the crop seriously, it is widely distributed. A knowledge of the losses it causes in other parts of the world leads pathologists to fear that a costly and uncontrollable epidemic might result if conditions should at any time prove particularly favourable for the parasite.

Again, as in former years, the fact has to be noted that though bunt is one of the few fungoid pests easily and certainly controllable by the wheat-grower, it is still far too prevalent.

In most parts of the country the blight disease was unusually late in putting in its appearance, with the consequence that the keeping properties of the crop may be more satisfactory than is often the case. The only specimen of any interest was one showing the disease on the fruits. The crop in this case was Myatt's Ashleaf—an early maturing potato which might well have been lifted before the appearance of the disease.

Bacterial rots of turnips and swedes, and somewhat severe outbreaks of both mildew and finger and toe on the latter host formed, as usual, the subject matter of several reports. The list of fungi responsible for diseases amongst fruit was practically

a counterpart of that of previous years. Silver leaf in plums, apple mildew and apple scab were again the pests most frequently reported on. Amongst bush fruits the puzzling phenomenon known as "reversion" in black currants, and the killing off of gooseberry bushes through attacks at soil level of a species of *Botrytis*, were the most important.

WEEDS.

The weeds sent for identification included two species suspected of causing poisoning amongst stock. One, hemlock, was in all probability responsible, but whether Dog's mercury was the actual cause of trouble was open to doubt. The slender foxtail (*Alopecurus agrestis*) was sent in together with other weeds from a newly-sown grass field where it was stated to be the most prevalent grass. As the species is not a common one, except under arable conditions, it will probably disappear. The opportunity will be taken to obtain information on this point by periodically examining a field near Cambridge where a similar state of affairs obtains.

R. H. BIFFEN.

School of Agriculture,
Cambridge.

ANNUAL REPORT FOR 1923 OF THE ZOOLOGIST.

INTRODUCTION.

JUST as 1922 was noteworthy as the frit-fly year, so 1923 stands out as the aphid year, almost all crops suffering more than usual from some green-fly attack. Probably the only exception was the bean aphid, which did not appear to be especially abundant. The spring weather was exactly suited to the requirements of the green-fly while it was so unfavourable to the insects which normally more or less control it that in many cases they did not appear at all until the harm was done. Moreover, crops were unable to make that rapid progress which sometimes results in their growing away from the pest. Fruit trees especially suffered.

In view of recent additions to our knowledge of the life-histories of the frit-fly and the wheat-bulb fly, it has been thought well to incorporate in the present report a revised version of the general account of the pests of cereal crops which appeared in the Annual Report of the Zoologist for 1900.

In the fruit section attention is called to a new method of dealing with "big bud" in black currants, suggested by Sir George Watt.

CEREALS.

A key to the principal pests of cereal crops, including a short account of their life-history and treatment.

Barley.—Crop failing in June or July. Whitish maggots or flaxseed-like puparia under sheathing leaves near a knot, above which the stalk often bends down *Hessian-fly*.

Ears "gouty" or swollen, and unable to emerge from the spirally-twisted sheathing leaves. Track eaten along one side of stem from the uppermost knot into the ear. Usually noticed in June, but can be detected earlier *Gout-fly*.

Some ears white while most are still more or less green. Largish grub or chrysalis in the very bottom of the stalk. *Corn saw-fly*.

Oats.—Sickly appearance of plant, with slightly swollen and twisted roots. No maggots visible to the naked eye. Probably *Stem eel-worm*.

Failure of very young crop. Minute white maggots in the stem just above the roots. *Frit-fly* (first brood).

Developing ears infested by minute white maggots in July and August, and either entirely destroyed or grain much reduced. *Frit-fly* (second brood).

Wheat.—Failure of young crop in April or May, with discoloration just above the root, where whitish maggots may be found *Wheat-bulb fly*.

Up-standing white stalks among the green, bowing, sound stems. Largish maggot or chrysalis in the very bottom of the injured stalk *Corn saw-fly*.

Swelling above first or second joint from the ground. Whitish maggots or flaxseed-like chrysalids inside sheathing leaves. Injured stalks often bend over *Hessian-fly*.

Small orange-coloured maggots feeding on the grain in the young ear *Wheat midge*.

Winter wheat failing like the young oat crop; minute white maggots in the stem just above the root *Frit-fly*.

1. HESSIAN-FLY. (*Mayetiola* (*Cecidomyia*) *destructor*.)

Most English farmers are now familiar with this insect, and the fears which its advent in 1886 very naturally occasioned have, to a large extent, subsided. Happily, this climate has not proved favourable to its development, and, moreover, we entirely escape the autumn attack, which is even more disastrous than

that of the spring brood in those countries where the autumn crops are sown at a much earlier date than in England.

Life-history.—The brown gnat-like fly is about the eighth of an inch in length, with long legs and antennæ. The two wings are smoky or clouded, and fringed with hairs. It appears in May, and lays its minute yellowish eggs near one of the knots of the stalk—usually the second from the ground. In four days the whitish grubs hatch out and fix themselves under the sheathing leaves, sucking the sap from the stem. When fully grown their outer skin hardens and turns dark brown, and they become chrysalids. It is these chrysalids (fig. 1) which are popularly termed "flaxseeds."

The flies emerge from some of these chrysalids in September, and in this country either perish or attack wild grasses. In America and South Europe they attack the autumn-sown corn.

Many of the chrysalids last over the winter, giving rise to flies the following May.

Plants infested.—Barley, wheat, rye, timothy, and couch-grass.

Treatment.—The following measures tend to prevent the recurrence of attack:—

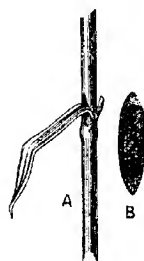


FIG. 1.—A. Wheat stem with "flaxseed" in position; B, "Flaxseed" magnified.

1. The destruction of "flaxseeds" found on threshing.

2. The burning or deep ploughing-in of the stubble.

3. The treatment of infested straw by close stacking or some other method to prevent the fly emerging.

4. The suppression of couch- or timothy-grass, as far as possible, in the neighbourhood.

5. The avoidance in adjoining fields of crops liable to attack (wheat, barley, rye).

6. The choice of strong-strawed varieties of such crops when next sown.

2. GOUT-FLY. (*Chlorops tæniopus*.)

This insect, which occurs especially in barley crops, is the cause of considerable annual loss.

Life-history.—This is a prettily-marked two-winged fly, one-eighth of an inch in length, straw-coloured, with black marks on the head and thorax.

The eggs are laid in May, within the sheathing leaves, near the top of the young plant, and the yellowish maggot furrows the stalk within and below the forming ear, causing it to shrivel, and often to remain enclosed within the sheathing leaves, which

become spirally twisted at the top and present a "gouty" appearance (fig. 2). In July the maggots change to brown puparia, out of which the flies appear in August.

Treatment.—If the attack is noticed early, its bad effects may be much diminished by the application of some quickly-acting, forcing manure, such as nitrate of soda. As the grubs attack the uppermost part of the stem, most of the puparia are carried off in harvesting the crop. Some, however, are shaken out and remain in the stubble. These puparia should be destroyed, as far as possible, before the flies emerge.

In the second place it is always observed that late-sown barley suffers most, for if the insect appears when the plant is young the whole crop may be destroyed. The following measures are therefore recommended :—

1. Scarify or cultivate the stubble immediately after harvest.
2. Destroy the chaff and "cavings" if found to contain puparia.
3. Use infested barley-straw at once for litter, or else stack it compactly so as to prevent the escape of the fly.
4. Sow early.
5. Keep down self-sown corn, and avoid rye or winter barley near infested fields.

3. FRIT-FLY. (*Oscinella frit*.)

Life-history.—The very small, glossy black fly, about one-twelfth of an inch in length, may be seen "dancing" about the oat plants at the end of April or the beginning of May. They have been observed affecting the flowers of Composite weeds at this time. The minute reddish eggs hatch into grubs which eat into the heart of the young oat plant just above the root. If the central shoot with the young ear is established, it sickens and readily comes away from the root. The maggots feed in the bulb during May, and turn to chrysalids in June. The flies come out in July, and lay their eggs in belated tillers or on the developing ears of the surviving oat



FIG. 2. — Barley attacked by GOUR-FLY. B shows the gouty ear; A, the channel cut by the grub along the stalk and into the ear.

plants and the larvæ soon bore in and attack the grain. If the ear is attacked at an early stage it is entirely destroyed, but if later, the grain is stunted and the yield reduced.

The flies from this brood emerge at harvest time and seek wild grasses on which to oviposit, but they also readily attack perennial rye-grass or Italian rye-grass, and when this crop is ploughed for wheat the grubs migrate from the ploughed-in rye-grass to the germinating wheat and may cause great destruction. The winter is passed in the larval stage. Grass land is always full of frit-fly maggots, and oats sown on newly-ploughed grass are sure to be attacked by the fly as well as by wire-worm and leather-jacket.

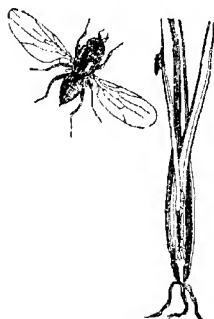


FIG. 3.—Frit-fly (enlarged) and infested oat plant.

Treatment.—1. Sow oats early; late-sown oats always suffer most.

2. Foreign oats purchased for sowing should be examined for the "puparia" or chrysalids.

3. In cases of very bad attack plough-in at once before the fly emerges.

4. At harvest time multitudes of the flies are often seen on the outside of the stacks, and some measures might be taken to prevent their escape to the fields in search of wild grasses.

5. Avoid rye-grass before wheat—either by a bastard fallow, or by selecting some other crop.

6. In suitable weather (with a prospect of rain), a dressing of nitrate of soda will sometimes push a crop through what threatens to be a rather severe attack.

4. WHEAT-BULB FLY. (*Leptohylemyia coarctata*.)

This insect is grey in colour and nearly the size of the common house-fly. Its white maggots, which may attain nearly one-third of an inch in length, are found feeding in the heart of young wheat plants from February onward.

Until recently nothing was certainly known of the life-history of the fly, though it has long been observed that wheat after fallow suffers most from its attacks.

Life-history.—The maggots observed in the wheat-bulb during the spring turn to flies in June and July. These flies do not seek any crops or wild grasses on which to deposit their eggs, but select bare ground where they oviposit in the middle of July. Most of these eggs do not hatch out till the following

spring, and there is only one brood annually. The maggots migrate from plant to plant—a habit which greatly adds to the destructiveness of the pest.

Treatment.—Arrange so that the land on which wheat is to be sown shall be well covered by some crop during the months of July and August. It is known that wheat after fallow suffers

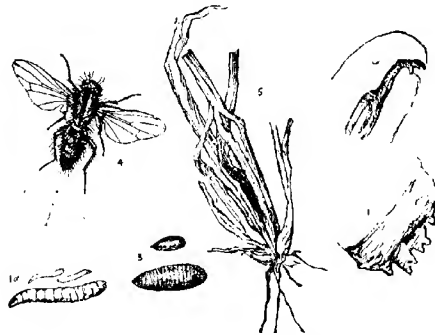


FIG. 4.—WHEAT-BULL FLY. (*Leptohylemyia coarctata*.)

- | | | |
|--|---------------------|--------------------------|
| 1a, maggot. | 1, mouth apparatus. | 2, extremity of tail. |
| 3, chrysalis. | 4, mature fly. | 5, infested wheat plant. |
| 6, 3, and 4, natural size and magnified. | | 1 and 2 magnified. |

most, but bad attacks often occur after crops—such as potatoes with sparse foliage—which leave a large proportion of the soil bare.

5. WHEAT MIDGE. (*Cecidomyia tritici*.)

The orange-coloured maggots found feeding in the wheat ears during June and July are the grubs of this small yellow midge or gnat-like fly. The midges themselves may often be seen swarming about the wheat on June evenings.

Life-history.—The female midge lays her eggs during June and the early part of July in the ears of the wheat, several eggs being deposited in the same ear.

The maggots feed on the grain for about three weeks, and then leave the ear to go down to the ground to pupate (or turn to chrysalids).

The true pupa or chrysalis is not formed till the following spring, but the grub spends the winter a few inches below the surface of the ground enclosed in a transparent case,

At harvest-time many of the maggots are not yet ready to descend, and are carried off with the crop. Thus after a severe attack both the harvested wheat and the remaining stubble require attention.

Treatment.—The measures indicated are:—1. Some treatment of the chaff and cavings which shall effectually destroy the grubs. 2. Deep ploughing of the stubble after attack.

6. CORN SAW-FLY. (*Cephus pygmaeus*.)

Life-history.—This insect does not belong, like the foregoing, to the Diptera or true flies, but to the Hymenoptera, the order which includes the bees and wasps.

It is unlike most saw-flies in being long and narrow, about one-third of an inch in length. It is black, with some yellow spots and bands, and with four transparent wings.

Saw-flies are so called because the females possess a remarkable apparatus in the form of a double saw, and with this the female of the corn saw-fly cuts a hole near the bottom of the stalk of wheat or barley in June, and in this hole she places the egg.

Most saw-fly grubs have many legs, but in that of the corn saw-fly they are rudimentary, and the creature is nearly legless. It feeds on the pith of the lower part of the stem, and grows to a length of about half an inch. Then it goes down to the very bottom of the stalk, which it bites through in such a way that it easily breaks off, as if cut clean about an inch from the ground. In the short length of straw below the cut the grub surrounds itself with a silken cocoon and turns to a chrysalis (fig. 5.)

If undisturbed it remains in this retreat till the following May, when a saw-fly emerges from the cocoon.

It is clear, therefore, that the pest entirely remains in the stubble, and none of the chrysalids or grubs are carried off in harvesting the crop.

Treatment.—Immediately after harvest take measures to destroy the stubble, by burning if practicable.



FIG. 5.—Wheat-stalk cut open to show injury done by CORN SAW-FLY. The chrysalis is seen in the bottom of the stalk, which is cut transversely above it.

7. STEM EEL-WORM. (*Tylenchus devastatrix*.)

If a young oat crop fails, and the presence of no insect pest can be detected, it is probable that it is suffering from the disease sometimes called "tulip-root." The plant becomes rank and sickly, and the bottom of the stem generally swells somewhat, while the bases of the leaves round the main shoot become gnarled and twisted.

The cause of the disease is not an insect, but a microscopic worm, which is present in myriads in the diseased stems. If an injured part is squeezed into a drop of water on a slide and examined with a moderate microscope, the small wriggling "eel-worms" will be readily seen. Clover crops also suffer from this pest, which is one cause of "clover sickness."

Treatment.—1. Dress affected crop with sulphate of potash.

2. Avoid clover after tulip-rooted oats.¹

3. Beware of using farmyard manure obtained from animals which have been feeding on eelworm-infested crops. The pest is frequently conveyed to clean land in such manure.

4. Deep cultivation, by burying deeply the infested stems of the stubble, diminishes future danger.

FRUIT.

Most of the recognised fruit pests were abundant in the past season, but by far the most universally destructive were the various species of aphids. These obtained a very early mastery over the trees, and in the case of the leaf-curling species it was quickly almost impossible to do much good by washing. In ordinary seasons certain useful grubs—noticeably those of the ladybirds and the hover-flies (*Syrphidae*), appear almost as soon as the green-fly and do much to keep that pest within bounds, but this year their arrival was very late, and in many cases the harm was already done when they came on the scene.

There is nothing of special interest to note with regard to the various other fruit pests enquired about, with the exception of the black currant gall-mite, against which a new method of treatment has been suggested.

"Big bud" in Black Currants.

In 1922 I received a very interesting letter from Sir George Watt, C.I.E. His success in dealing with a mite infesting the tea plant in India, by firing, had suggested to him the idea that

¹ It often occurs that clover has been put in with oats which develop "tulip-root." In such cases the clover is almost certain to become "stem-sick," and it is better to anticipate this, feed it off bare in the autumn and treat it as stubble, a catch-crop of rape being taken on the land after thorough scarifying.

it might be possible to control the black currant mite by the same means, and he was conducting some experiments which promised well. As he intended publishing his results as speedily as possible, he naturally did not wish me to mention the matter in my Report of last year. His pamphlet has now appeared under the title, "A Note on the Big Bud of the Black Currant (*Eriophyes ribis*)," issued from the Crichton Royal Institution, Dumfries, and is of the highest importance.

Sir George's plan is to fire the plot of bushes in March. Straw, waste paper, dry twigs and other combustible matter are collected and packed in and among the bushes, and so arranged that every square foot of ground is at least scorched. If any bushes or any portions of the soil escape from the first firing they are fired a second time. It is then found that nearly all the plants recover, and by June have sent up shoots a foot high, with no sign of mite.

In his main experiment, 427 Boskoop Giant plants so badly infested as to be worthless, though all known remedial methods had been tried—including cutting them down almost to the ground in 1918—were fired on March 28, and on July 18 the report was that 91.1 per cent. had completely recovered, and that so far there was no sign of the re-appearance of the mite. The cost of firing was £13 13s. 6d. This seems excessive, and there must be many places where the operation can be carried out at a much lower cost.

I may say that, in consequence of the correspondence with Sir George Watt, firing was tried at Cambridge last winter on a few fairly isolated and badly infested plants. They have come up strongly, and it was hoped that they had been cleared of the mite, but a very close examination has revealed a few buds containing the pest. Further experiment is necessary, and if any Members of the Society have an opportunity of giving the method a thorough trial, their experience would be of great value.

No hibernation of the mite in the soil has ever been demonstrated, but the fact that the severest pruning does not clear the plants, while this is achieved by burning them *and the surface soil*, points strongly to the conclusion that such hibernation must occur.

A few red currant bushes incidentally included in Sir George Watt's firing experiments also completely recovered, and this is not unimportant, for in my first investigation of the mite I found that red currant plants near the infested black currants harboured the pest, though themselves showing no signs of injury.

Members are reminded of Mr. Goude's plan of obtaining mite-free cuttings from infested bushes by utilising the new shoots before the mites have migrated to them. The new shoots are

taken in May, dipped in an aphid wash to destroy wandering mites, and struck in a frame. Should Sir George Watt's method of firing prove practicable we shall have another powerful weapon against this most formidable pest.

MISCELLANEOUS NOTES.

Many enquiries have been received with regard to various creatures infesting houses or stored goods, and though usually they have little importance, it is thought advisable to put them on record here.

In May last, Mr. Theobald sent me some ticks found in cottages near Canterbury, though I was assured there were no domestic animals in the cottages. The species proved to be *Ixodes hexagonus*, a tick especially affecting hedgehogs, though found on various animals.

Grubs infesting a whey cistern near Bedford in August proved to be those of the fungus-gnat (*Rhyphus fenestralis*). These "red worms" often occur in fermenting material.

Larvæ of *Piophilæ casei*, the fly responsible for the well-known maggots in cheese, were reported to be infesting the wrappings of hams at Hereford in September, but the hams themselves were not attacked.

The sugar-mite (*Glyciphagus domesticus*) was complained of on several occasions as a general nuisance in houses. It occurred, in company with psocids, in some new houses at Letchworth. Various psocids (book-lice) were also complained of as occurring in food-stuffs—in one case in a mixture for the manufacture of sponge-cake. *Anobium*, *Plinus* and other beetles figured among the specimens sent for identification.

CECIL WARBURTON.

School of Agriculture,
Cambridge.

THE WORK OF THE AGRICULTURAL RELIEF OF ALLIES COMMITTEE.

THE work of the Agricultural Relief of Allies Committee, which was completed in 1923, was a remarkable example of entire and successful co-operation by agricultural interests. The Committee was a body formed on the initiative of the Royal Agricultural Society and charged with the task of giving practical expression to the feelings of sympathy which were entertained in England for the farmers on the Continent who suffered so severely during the war from 1914 to 1918. It was fitting that the Royal Agricultural Society should take the initiative in the organisation of a general fund which should be thoroughly representative of the interests of the farming community of

this country, for it may be recalled that the Society had similarly inaugurated a relief fund for the French peasants after the Franco-Prussian war of 1870-1, when this country was merely a spectator of the struggle, and not, as in the present instance, a participant. His Majesty the King having graciously afforded his patronage to the movement, the lead of the Royal Agricultural Society was readily followed, and every agricultural body of importance gave its support, so that, early in 1915, it was possible to form an Executive Committee of the most representative kind.

The French Peasants' Seed Fund—the name by which the relief movement of 1871 was known—dealt with funds amounting to £52,000; the Agricultural Relief of Allies Committee distributed relief to a total value of £253,913, a figure which, though small in proportion to the enormous amount of damage caused by the war among Allied farmers, did enable substantial help to be given. But of greater importance than the intrinsic value of the relief given was the gesture of sympathy on the part of English agriculturists towards those in the devastated countries. Indeed, the international goodwill generated by the operations of the Committee was one of the remarkable features of the work; especially was this the case immediately after the Armistice, when, quickly and effectively, the Committee began their more important distributions, and it was realised by those to whom help was offered that English sympathy was something more than a matter of kind phrases.

It was early in 1915 that a committee was formed by the Royal Agricultural Society to co-ordinate efforts which were being made in various quarters, and as the result of their work all associations and individuals desirous of assisting were brought into touch, and a large General Committee was formed. In turn this Committee delegated the duties of organisation and administration to an Executive Committee with the Duke of Portland (the President of the Royal Agricultural Society for the year) as President, Lord Northbrook, Chairman, and Mr. C. Adeane as Honorary Treasurer, the members of the Executive being: The Duke of Devonshire, K.G., the Marquis of Bath, the Earl of Scarbrough, Lord Blyth, Lord Rathdonnell, the Right Hon. Sir Ailwyn Fellowes, K.C.V.O. (now Lord Ailwyn), the Hon. E. G. Strutt, Sir Gilbert Greenall, Bart., C.V.O., Sir Richard Paget, Bart., Sir Rider Haggard, Mr. Adeane, C.B., Mr. T. L. Aveling, Mr. Wm. Bainbridge, Capt. Chas Bathurst, M.P. (now Lord Bledisloe), Mr. Samuel Bostock, Mr. Edward Brown, Mr. J. J. Cridlan, Mr. David Davies, M.P., the late Dr. Charles M. Douglas, Mr. (now Sir) H. Trustram Eve, Mr. F. A. Gardiner, Mr. Wm. Harrison, O.B.E., Mr. R. G. Heaton, Mr. John Howard Howard, Mr. Samuel Kidner, Mr. (now Sir) Herbert Matthews, the late Mr. G. Norris Midwood, Mr. S. Palgrave Page,

Mons. E. Pollet, Mr. Rowland E. Prothero, M.V.O. (now Lord Ernle), the late Sir Beville Stanier and Mr. Martin H. F. Sutton. The Committee had power to add to their number, and from time to time the following additions were made: The Duke of Richmond and Gordon, K.G., the Earl of Lonsdale, the Earl of Leicester, the late Lord Middleton, Sir Lionel Phillips, Sir Howard Frank, Bart., K.C.B., the late Lord Northbourne, the Right Hon. Sir Horace Plunkett, K.C.V.O., Mr. E. J. Beaumont Nesbitt, Mr. Colin Campbell, Mr. Richardson Carr, the late Mr. W. Fitzherbert-Brockholes, Mr. Richard M. Greaves, Mr. F. Percy Low, Mr. E. M. Nunneley, Mr. Ernest Parke, Mr. P. J. Poels, Dr. William Somerville, M.A., Professor Biffen, Mr. Anderson Graham, the late Mr. C. W. Marsters, the late Mr. H. W. Palmer, Mr. Percy Hurd, M.P., Dr. J. W. Robertson (Canada), Senator A. J. Fuller (South Africa), Senator Keating (Australia), Mr. C. E. Elgar, Mr. R. D. D. McLean (New Zealand), the late Mr. R. W. Hobbs, Mr. John Evens and Mr. Alfred Mansell.

In some quarters it was thought that the energy with which the Committee took up their task was premature; that it was not necessary to collect funds until the end of the war was more distinctly in sight. Happily such counsels were not heeded, for at the end of the prolonged struggle in 1918 the public purse was so lightened that failure would have been practically certain had the appeal for help been deferred until then.

The Committee's first step was the formation of sub-committees charged with dealing with different aspects of the work. The Finance Committee, under the Chairmanship of Mr. Adcane, was responsible for general administration; the Live Stock Committee (Chairman, Sir Gilbert Greenall) supervised the purchase of animals; the Implements Committee (under the Chairmanship first of Mr. R. M. Greaves and later of Mr. William Harrison) dealt with machinery. There were also the Seeds, Cereals, and Miscellaneous Committee (Chairman, the late Mr. Midwood); the Publicity Committee (under the chairmanship first of Mr. Parke and later of Sir Howard Frank); and the Empire Committee (Chairman, Sir Howard Frank), the last-mentioned Committee being appointed at a later date to obtain the co-operation of farming interests in the Dominions.

In order to cover the country effectively in the matter of the collection of subscriptions a branch committee was formed in each county, whose activities were directed towards securing substantial sums by, among other means, gift sales, which became a strong feature of the work of most war charities. In the formation and working of these county committees the National Farmers' Union and its branches, the auctioneers, the Chambers of Agriculture, the county and district agricultural associations all gave most practical help, and, with all the Breed Societies

Simultaneously with the collection of funds, the means of buying, collecting and shipping relief were organised and perfected, with the result that on the conclusion of the Armistice the Committee were in a position immediately to begin the consignment of their gifts, inquiries having been made on the spot as to the form in which relief could most usefully be given and the regions in which it would be most effective. Live stock was the great need in every case, and accordingly the Committee, who had sent some quantities of seeds and machinery to France during the progress of the war, now restricted their gifts entirely to good class English stock, the females being of useful type and the males in every case pedigree animals.

All the Committee's gifts were made direct to the Government of the country in which relief was offered, everything being transported to the port of arrival free of all charges, rail to the distributing centres being the concern of the accepting Government. In France, the distribution was carried out by the *Directeurs des Services Agricoles* in the various Departments; in Belgium, the Director of Agricultural Reconstruction for Western Flanders, Mr. Leon Boereboom, carried out the task; and in Serbia and Roumania the gifts were handed over to persons appointed by the Government in each case.

There was considerable delay in the completion of the work of relief owing to many unforeseen interruptions. Frequent outbreaks of foot and mouth disease prevented the movement and export of live stock; delay also arose through the difficulties of arranging the transport of the gift to Roumania, and the work was further prolonged by the allocation to the Committee, in 1921, of £18,000 from the surplus funds of the British Ambulance Committee for distribution in France in the form of live stock.

A glance at the help given in each of the countries assisted will probably be of interest.

FRANCE.—The relief work in France, where gifts were made of a total value of £92,209, may be described in the words of the Committee's final report:

"The first relief given by the Committee in France consisted of a supply of machinery for harvesting purposes and for autumn and winter ploughing in the Departments of the Marne and the Meuse. This was sent in 1915 as the result of inquiries made on the spot by the Earl of Northbrook, Mr. Adcane, and Mr. Anderson Graham. Live stock followed in the form of 61 Southdown rams, of which 5 were from the estate of His Majesty the King at Sandringham. A dozen boars, 2,449 head of live poultry, and considerable quantities of seed corn and seed potatoes were also sent during 1915. In 1916 and 1917, seed oats, seed barley, and seed potatoes were again sent, as

well as a quantity of binder twine, of which there was great scarcity in the harvest fields behind the war zone. Live poultry was also given, and in order to assist in the re-planting of some of the pine forests destroyed during the earlier fighting ten cwt. of pine seeds were sent. The orchards of many of the farms in the Marne, the Somme, the Oise, and the Aisne were also furnished with fruit trees, of which the Committee sent out 8,850.

"After the cessation of hostilities, the Committee, on the recommendation of the Hon. Treasurer, decided to concentrate their relief efforts in the Department of the Somme, the association of British troops with that Department making it an appropriate district for help. Delay was caused, however, by the entire absence of farm buildings for shelter, and it was June, 1919, before the condition of the district justified the Committee in sending out any stock. By the middle of August, 800 head of cattle were in the hands of the small farmers in the Department of the Somme, and thereafter considerable quantities of sheep and pigs were consigned at regular intervals until February, 1920, when the Committee had distributed stock to a total value in France of £74,504, and had completed its original programme. The last two consignments in 1920 were of sheep."

In 1922 the Committee made further inquiries in France regarding the districts in which the British Ambulance Committee's surplus might be offered with greatest benefit, and, acting on a suggestion made by Lord Hardinge, the British Ambassador in Paris, it was decided to allocate the gifts to the Departments of the Aisne, the Pas de Calais, and the Marne. The first of these supplementary consignments was sent on July 28, 1922, and was handed over at Boulogne to the Directeur des Services Agricoles for the Department of the Aisne, being subsequently distributed by him to small breeders and farmers. Shipments alternately to the Aisne and the Pas de Calais followed at fairly regular intervals, with one to the Marne, consisting of poultry. In order to encourage dairy production, the Committee sent sets of milk-weighing and testing apparatus for use in the official recording of the milk given by the stock. Pigs and sheep and poultry in considerable numbers were also given in regions where conditions were more suited to these classes of stock.

From time to time exceptionally severe weather was encountered in the Channel, but all animals were safely landed.

BELGIUM.—It was on March 12, 1919, that the first consignment of relief was sent to Belgium. It consisted of Dairy cattle and eggs for incubation. It was handed over at Antwerp to Mr. Boereboom, the Director of Agricultural Reconstruction in Western Flanders, and in the course of a few days was distrib-

buted by him among the peasant farmers in the Yser Valley, the recipients being chosen from among those who had kept a certain quantity of dairy stock before the war. Other consignments followed at frequent intervals, and the Committee's own shipments were supplemented by two others of Ayrshire cattle made by them on behalf of the Scottish Committee. Between 1919 and 1922 ten further consignments were made to Belgium, most of them having been provided out of the accumulations of interest on the invested funds and from the balances on the various accounts, in accordance with a resolution passed by the Committee that all such moneys should be allocated to that country. The shipments followed on the lines of those preceding, and were in accordance with requests and recommendations made by Mr. Boereboom as to their suitability.

Belgian farmers were very warm in their expressions of gratitude to the Committee, and through them, to British agriculturists; and each year since the first live stock was received they have organised displays of the animals and their progeny in towns and villages in the devastated districts. The first of these was at Handzaeme in 1919, and it was followed by similar exhibitions at Ypres (twice), Dixmude, and Bruges, the last mentioned being attended by H.M. the King of the Belgians, who made a point of examining and admiring the stock and of expressing his own gratefulness to the English people. The total value of the Committee's gifts to Belgium was £60,770.

SERBIA.—During the war the Committee maintained and provided agricultural education and training for a number of young Serbians awaiting the opportunity of returning to their own country. About a dozen of these youths were first placed with well-known English and Scottish farmers under whom they obtained some knowledge of the general practice of farming and stock rearing, and afterwards they proceeded to agricultural colleges, where they were maintained for nearly two years by the Committee, the Colleges defraying their tuition fees. The results of the experiment were very gratifying, several of the students doing well in the dairying and other examinations for which they entered, and they were thus in a position to apply a useful insight into English methods to the agriculture of their own country on their return.

Inquiries as to the needs of Serbia in the matter of relief had been made for the Committee by Mr. W. J. Henman in 1915 and Major Kendzior in 1919, and in the last-mentioned year the first consignment went out to that country, many difficulties having first been overcome. Not the least of these resulted from the seizure of Fiume by D'Annunzio at the moment when the committee's gift of 587 cattle and 2,000 poultry was

on the point of leaving Cardiff for that Adriatic port. The stock was held up for about a fortnight, and in the meantime arrangements were made for the boat to land its cargo at the small and obscure port of Buccari, a little further south of Fiume. The difficulties of rail transport were greatly increased on arrival, but coal for the trains had been taken with the cattle, and the stock was not only safely landed but was distributed in the interior without loss. Costs of the stock, transport, fodder, attendance, insurance and maintenance amounted to £18,542, a sum which the British Treasury later refunded as part of their help to Balkan peoples, and with this refund the Committee were enabled to resume their relief for Serbia. This time, after careful inquiry, it was found that seeds and agricultural and horticultural implements would be most acceptable to the peasantry, and three large consignments were made in 1921. By October of that year relief of the value of £68,525 had been distributed.

ROUMANIA.—In 1920 the Committee made a grant for helping Roumanian small farmers, conditional upon the Roumanian Government arranging and providing transport facilities. It was not until November, 1921, that negotiations for the transport of the gift were completed, and in January, 1922, the stock, comprising bulls, heifers, pigs and poultry, left Liverpool. In a violent gale in St. George's Channel shortly after leaving port the boat, the *Aviemore*, shipped a heavy sea which carried away a portion of the cattle shedding, two heifers being so badly injured as to necessitate destruction. After the storm, however, the rest of the journey was uneventful and 22 more head were actually landed at Constanza than had been shipped, the number having been increased by births during the five weeks' voyage. On their arrival at Bucarest the cattle were housed temporarily in the Farm School where they were inspected by the King and Queen of Roumania. Their Majesties expressed deep thanks for so practical a gift and their astonishment at the quality of the stock and its remarkable condition after so long a voyage. Major Marples, who supervised the distribution of the stock on behalf of the Committee, drew up a series of regulations governing the retention of the animals in the hands of the recipients, the object being to ensure that the gift should be used as the nucleus for breeding on the Moldavian plains. The value of this relief to Roumania, including transport expenses, was £13,481.

Dealing with the relief as a whole, the following tabular statement summarises the Committee's gifts to all the countries concerned :

LIVE STOCK

	Bulls.	Heifers.	Rams.	Ewes.	Boars.	Gilts.	Goats.	Poultry and Eggs.	Horses.
France . .	77	982	231	2,007	62	557	2	8,467	—
Belgium . .	54	907	65	1,480	63	613	413	7,694	6
Serbia . .	30	550	—	—	—	—	—	2,000	—
Roumania .	30	72 ¹	—	—	21	64	—	465	—
Poland . .	—	—	—	—	—	—	—	362	—
Totals . .	191	2,511	316	3,577	146	1,234	415	18,988	6

¹ Including Calves.

AGRICULTURAL IMPLEMENTS, ETC.

	Binders, Ploughs, Threshing Machines, Drills, Mowers, etc.	Small Tools.
France	163	—
Serbia	748	8,210
Totals	911	8,210

SEEDS.

	Wheat. Sacks.	Oats and Barley. Sacks.	Potatoes. Sacks.	Tares. Sacks.	Vegetable Seeds. Tons.	Pasture Seeds. Tons.
France	800	2,056	892	—	—	—
Serbia	—	140	—	20	42	29
Totals	800	2,196	892	20	42	29

MISCELLANEOUS.

	Binder Twine. Tons.	Pine Seed. Cwt.	Fruit Trees.
France	5	10	8,850

A summary of the cash receipts and payments for the whole period of the Fund is given below as audited, together with a supplementary statement relating to the allocation of the relief in kind offered by societies and individuals:

SUMMARY OF CASH RECEIPTS AND PAYMENTS FROM 9TH MARCH, 1915, TO 31ST MARCH, 1923.

RECEIPTS.	£	s.	d.	PAYMENTS.	£	s.	d.
Donations	133,910	17	6	Relief distributed . .	225,082	8	11
Gift Sales, and Flag Day Receipts, less Expenses . .	82,202	6	0	Expenses of Office and Staff, Printing, Stationery, Postage, etc. . . .	7,492	4	8
Income from Investments, and Interest	19,592	19	11	Publicity, Cost of Special Appeals, etc.	3,133	0	2
Sundry Receipts . .	1	10	10				
	£235,707	14	3		£235,707	14	3

Audited and found correct.

DELOITTE, PLENDER, GRIFFITHS & Co.

18th April, 1923.

Honorary Auditors.

	£	s.	d.
The amount spent on Relief has been apportioned as follows :—			
France	81,814	4	11
Belgium	60,770	2	0
Serbia	68,525	11	9
Poland	491	4	4
Roumania	13,481	5	11
	<u>£225,082</u>	<u>8</u>	<u>11</u>
In addition, the following Gifts in kind have been made :—			
France	10,394	15	4
Belgium (Scottish Committee)	9,436	0	0
Various Countries (Canadian Committee)	9,000	0	0
Bringing the total value of all Relief to	<u>£253,913</u>	<u>4</u>	<u>3</u>
Adding the Expenses	<u>£10,625</u>	<u>5</u>	<u>4</u>
The total of the Fund amounted to	<u>£264,538</u>	<u>9</u>	<u>7</u>

The expenses of administering the Fund were remarkably low. For the full period the total administration costs, including the expense of organising special appeals, were £10,625, and were met out of £19,592 received as interest on invested funds, the balance, £8,967 of this interest being applied in relief. The expenses of "running" the Fund represented 2·8 per cent., and the expenses of publicity were 1·1 per cent.

In a very large measure the remarkable success of the Fund was due to the personal initiative of, and the active supervision by, its three chief officers—the Duke of Portland, Lord Northbrook, and Mr. Adeane. Supported by an enthusiastic committee and by loyal officials, they were unsparing in their efforts to make the Fund not only an instrument of practical assistance but an achievement worthy of the happy union of English agricultural interests under the leadership of the "Royal."

J. P. GOODWIN.

Royal Agricultural Society of England.

(Established May 9th, 1838, as the ENGLISH AGRICULTURAL SOCIETY, and incorporated by Royal Charter on March 26th, 1840.)

Patron.

HIS MOST GRACIOUS MAJESTY THE KING.

President for 1924.

ERNEST MATHEWS, ESQ., C.V.O.

Trustees.

Year when
first elected
on Council

- 1919 H.R.H. THE PRINCE OF WALES, K.G., *York House, S.W.1.*
- 1922 H.R.H. THE DUKE OF YORK, K.G., *White Lodge, Richmond Park.*
- 1905 ADEANE, CHARLES, C.B., *Babraham Hall, Cambridge.*
- 1903 AILWYN, LORD, K.C.V.O., K.B.E., *Honington, Norwich.*
- 1895 BEDFORD, DUKE OF, K.G., *Woburn Abbey, Bedfordshire.*
- 1871 BOWEN-JONES, Sir J. B., Bart., *Council House Court, Shrewsbury.*
- 1893 CORNWALLIS, Col. F. S. W., *Linton Park, Maidstone, Kent.*
- 1885 COVENTRY, Earl of, *Croome Court, Severn Stoke, Worcestershire.*
- 1898 DEVONSHIRE, Duke of, K.G., *Chatsworth, Bakewell, Derbyshire.*
- 1904 GREENALL, Sir GILBERT, Bart., C.V.O., *Walton Hall, Warrington.*
- 1869 NORTHROOK, Earl of, *Stratton, Micheldever, Hampshire.*
- 1881 PARKER, Hon. CECIL T., *The Grove, Corsham, Wiltshire.*

Vice-Presidents.

- 1897 COLTMAN-ROGERS, C., *Stanage Park, Brampton Bryan.*
- 1887 CRUTCHLEY, PERCY, *Sunninghill Lodge, Ascot, Berkshire.*
- 1908 DERBY, Earl of, K.G., *Knowsley, Prescot, Lancashire.*
- 1900 GREAVES, R. M., *Wern, Portmadoc, North Wales.*
- 1910 HARLEIGH, LORD, Brogyntyn, *Oswestry, Shropshire.*
- 1904 MATHEWS, ERNEST, C.V.O., *Little Shardeloot, Amersham, Bucks.*
- 1915 PORTLAND, Duke of, K.G., *Welbeck Abbey, Worksop, Notts.*
- 1914 POWIS, Earl of, *Powis Castle, Welshpool, Mont.*
- 1897 REYNARD, FREDERICK, *Sunderlandwick, Driffild, Yorkshire.*
- 1905 RICHMOND AND GORDON, Duke of, K.G., *Goodwood, Chichester.*
- 1891 STANYFORTH, Lt.-Col. E. W., *Kirk Hamerton Hall, York.*
- 1907 YARBOROUGH, Earl of, *Brocklesby Park, Lincolnshire.*

Ordinary Members of the Council.

- 1910 ALEXANDER, HUBERT D., *The Croft, Sully, near Cardiff (Glamorgan).*
- 1923 ASHTON, T. W., *Estate Office, Hursley Park, Winchester (Hampshire).*
- 1905 AVELING, THOMAS L., *Boley Hill House, Rochester (Kent).*
- 1911 BEHRENS, Major CLIVE, *Swinton Grange, Malton (Yorks, N. Riding).*
- 1922 BELL, JOHN, *Wollaton, Nottingham (Nottinghamshire).*
- 1919 BENTINCK, Lord HENRY, M.P., *Underley Hall, Kirkby Lonsdale (Westmorland).*
- 1921 BLEDISLOE, LORD, K.B.E., *Lydney Park (Gloucestershire).*
- 1922 BROCELEBANK, Rev. C. H., *Bartlow House, near Cambridge (Cambridgeshire).*
- 1906 BROCKLEHURST, HENRY DENT, *Sudeley Castle, Winchcombe (Glos.).*
- 1910 BROWN, DAVIS, *Marham Hall, King's Lynn (Norfolk).*
- 1918 BURKE, U. ROLAND, *Chatsworth, Bakewell (Derbyshire).*
- 1923 BURKITT, WILLIAM, *Grange Hill, Bishop Auckland (Durham).*
- 1921 BURRELL, Sir MERRIK R., Bart., *Knepp Castle, Horsham (Sussex).*
- 1905 CARR, RICHARDSON, *Mill Lawn, Burley, Brookenhurst, Hants. (Hertfordshire).*
- 1913 CHAPMAN, W. W., 4, *Mowbray House, Norfolk Street, W.C.2 (London).*
- 1919 COVRES, DANIEL, *Dinton Manor, Salisbury (Wiltshire).*
- 1921 COURTHOPE, Col. G. L., M.C. M.P., *Whilgh (Sussex).*
- 1917 CURRIE, Col. EDWARD, *Itton Court, Chapstow (Monmouthshire).*
- 1921 DAVIES, DAVID, M.P., *Brancion, Llandinam (North Wales).*
- 1923 DICKIE, ROBERT, *Knockenigg, Sanguhar (Scotland).*
- 1923 DISBROWE-WISE, Lt.-Col. H. E. D., *Walton Hall, Burton-on-Trent (Derbyshire).*
- 1913 EVENS, JOHN, *Burton, near Lincoln (Lincolnshire).*

Year when
first elected
on Council.

Ordinary Members of the Council (continued).

- 1905 FALCONER, JAMES, *Northbrook Farm, Micheldever Station (Hampshire).*
 1921 FENWICK, E. GUY, *North Luffenham Hall, Stamford (Rutland).*
 1924 *GARRETT, COL. FRANK, *New Haven, Leiston, Suffolk.*
 1922 GATES, B. J., *Wing Park, Leighton Buzzard (Buckinghamshire).*
 1916 GILBEY, SIR WALTER, Bart., *Elsenham Hall, Elsenham (Essex).*
 1921 GROOM, HUBERT, *Sunderland, Docking, King's Lynn (Norfolk).*
 1905 HARRIS, JOSEPH, *Brackenbrough Tower, Carlisle (Cumberland).*
 1903 HARRISON, WILLIAM, *Albion Iron Works, Leigh (Lancashire).*
 1909 HAZLERIGG, SIR ARTHUR G., Bart., *Noseley Hall (Leicestershire).*
 1905 HISCOCK, ARTHUR, *Manor France Farm, Stourpaine, Blandford (Dorset).*
 1919 HOBBS, ROBERT, *Kelmscott, Lechlade, Glos. (Oxfordshire).*
 1923 HOWKINS, BENJAMIN, *Bramham, Bedford (Bedfordshire).*
 1923 JOHNSTONE, CAPT. GEORGE H., *Tregoose, Grampound Road (Cornwall).*
 1913 KELLY, MAJOR DUNBAR, D.S.O., *Godinton, Ashford, Kent (Surry).*
 1912 LANE-FOX, LT.-COL. G. R., M.P., *Bramham Park, Boston Spa (York, W. Riding).*
 1918 LLEWELYN, COL. C. VENABLES, *Llysdiman, Newbridge-on-Wye (South Wales).*
 1909 LUDDINGTON, J. L., *Wallington Hall, King's Lynn (Cambridgeshire).*
 1909 MANSELL, ALFRED, *College Hill, Shrewsbury (Shropshire).*
 1922 MATTHEWS, FRANK P., 27 Cavendish Square, W.1 (London).
 1904 MIDDLETON, CHRISTOPHER, *Vane Terrace, Darlington (Durham).*
 1922 MILDMAY OF FLETT, LORD, *Flete, Ermington S.O. (Devon).*
 1922 MILN, G. P., *Abbot's Lodge, Chester (Cheshire).*
 1920 MONTGOMERY, ANDREW M., *Netherhall, Castle Douglas (Scotland).*
 1916 MOUNT, SIR WILLIAM A., Bart., C.B.E., *Wasing Place, Reading (Berkshire).*
 1911 MYATT, JOHN, *Lincoln House, Shenstone, Lichfield (Staffordshire).*
 1922 NEILSON, R. B., *Holmwood, Sandiway (Cheshire).*
 1922 NEWTON, SIR DOUGLAS, K.B.E., M.P., *Croxton Park, St. Neots (Huntingdonshire).*
 1915 OLIVER-BELLASIS, CAPT. R., *Shilton House, Coventry (Warwickshire).*
 1910 OVERMAN, HENRY, *Weasenham, King's Lynn (Norfolk).*
 1909 PATTERSON, R. C., *Acton Hill, Stafford (Staffordshire).*
 1912 PERKIN, A. W., *Greenford Green, Harrow (Middlesex).*
 1921 PLATT, MAJOR ERIC J. W., *Gorddino, Llanfairfechan (North Wales).*
 1906 PLUMPTRE, H. FITZWALTER, *Goodnestone, near Canterbury (Kent).*
 1916 PRICE, F. HAMLYN, 7 Harley Gardens, *The Boltons, S.W.10 (London).*
 1924 *RANSOME, EDWARD C., *Highwood, Ipswich.*
 1905 REA, GEORGE GREY, *Doddington, Wooler R.S.O. (Northumberland).*
 1923 SAMPLE, C. H., 29 Grainger Street West, *Newcastle-on-Tyne (Northumberland).*
 1922 SHERWOOD, S. R., *Playford, Ipswich (Suffolk).*
 1921 SILCOCK, T. B., *Arthfield House, Poulton-le-Fylde (Lancashire).*
 1907 SMITH, FRED, *Deben Haugh, Woodbridge (Suffolk).*
 1921 *SOMERVILLE, PROF. W., M.A., D.Sc., *School of Rural Economy, Oxford.*
 1912 STRACHIE, LORD, *Sutton Court, Pensford (Somerset).*
 1923 STRAKER, FREDERICK, *Angerton Hall, Morpeth (Northumberland).*
 1922 STRUTT, HON. EDWARD G., C.H., *Whitelands, Hatfield Peverell (Essex).*
 1923 TANNER, E. CRAIG, *Eyton-on-Severn, Cross Houses (Shropshire).*
 1918 TAYLOR, C. HOWARD, *Middlewood Hall, Barnsley (York, W. Riding).*
 1920 THORNTON, F. H., *Kingsthorpe Hall, Northampton (Northants).*
 1907 TINDALL, C. W., *Park House, Louth (Lincolnshire).*
 1923 TOMKINSON, MAJOR C. W., *Willington Hall, Tarporley (Cheshire).*
 1904 TURNER, ARTHUR P., *Fayre Oakes, Hereford (Herefordshire).*
 1923 TWENTYMAN, J. R., *Kirby Misperton Hall, Pickering (York, S. Riding).*
 1889 WHEELER, COL. E. VINCENT V., *Newnham Court, Tenbury (Worce).*
 1921 *WILKETHAM, C. DAMPIER, M.A., F.R.S., *Upwater Lodge, Cambridge.*
 1918 WICKHAM-BOYNTON, T. L., *Burton Agnes Hall (York, E. Riding).*
 1916 WRENCH, RT. HON. FREDERICK, *Killaconnora, Hythe, Kent (Ireland).*

* Nominated Member of Council.

STANDING COMMITTEES.

* * Under By-Law 39, the PRESIDENT is a Member *ex officio* of all Committees, and the TRUSTEES and VICE-PRESIDENTS are Members *ex officio* of all Standing Committees except the Committee of Selection.

The Honorary Director is a Member ex officio of all Committees.

Finance Committee.

ADEANE, C. (<i>Chairman</i>)	GREENALL, Sir G.	GREAVES, R. M.
DEVONSHIRE, Duke of	AVELING, T. L.	HARRISON, W.
NORTHBROOK, Earl of	CARR, RICHARDSON	MANSELL, ALFRED
AILWYN, Lord	CORNWALLIS, Col.	MATHEWS, ERNEST
BURRELL, Sir MERRIK R.	CRUTCHLEY, PERCY	WHEELER, Col.

Journal and Education Committee.

CORNWALLIS, Col.	ADEANE, C.	LUDDINGTON, J. L.
(<i>Chairman</i>)	BROCKLEHURST, Rev. C. H.	MANSELL, ALFRED
BLEDISLOE, Lord	CHAPMAN, W. W.	MATHEWS, ERNEST
MILDMAY OF FLETE, Lord	COLTMAN-ROGERS, C.	PLUMITRE, H. F.
BOWEN-JONES, Sir J. B.	COURTHOPE, Lt. Col. G. L.	PRICE, F. HAMLYN
BURRELL, Sir MERRIK R.	DISBROWE-WISE, Col.	WHEELER, Col.

Chemical Committee.

LUDDINGTON, J. L.	FALCONER, J.	SAMPLE, C. H.
(<i>Chairman</i>)	GREAVES, R. M.	SILCOCK, T. B.
BLEDISLOE, Lord	MIDDLETON, C.	SMITH, FRED.
HARLESCH, Lord	NEILSON, R. B.	SOMERVILLE, Prof.
BOWEN-JONES, Sir J. B.	OLIVER-BELLASIS, Capt. R.	TAYLOR, C. HOWARD.
BROCKLEHURST, H. D.	PATTERSON, R. G.	TURNER, A. P.
BURKITT, W.	REYNARD, F.	WHETHAM, C. D.

Botanical and Zoological Committee.

COLTMAN-ROGERS, C.	BROCKLEHURST, H. D.	LUDDINGTON, J. L.
(<i>Chairman</i>)	BROWN, DAVIS	MILN, G. P.
BOWEN-JONES, Sir J. B.	CORNWALLIS, Col.	PLUMITRE, H. F.
HAZLERIGG, Sir A. G.	COURTHOPE, Lt.-Col. G. L.	TAYLOR, C. HOWARD
NEWTON, Sir DOUGLAS	LLEWELYN, Col.	WHEELER, Col.

Veterinary Committee.

NORTHBROOK, Earl of	BURKE, U. ROLAND	MONTGOMERY, A. M.
(<i>Chairman</i>)	CARR, RICHARDSON	OVERMAN, HENRY
AILWYN, Lord	CHAPMAN, W. W.	*PRESIDENT OF
MILDMAY OF FLETE, Lord	CRUTCHLEY, PERCY	ROYAL COLLEGE
PARKER, Hon. C. T.	DISBROWE-WISE, Col.	OF VET. SUR-
BURRELL, Sir MERRIK R.	FENWICK, E. GUY	GEONS
GILBEY, Sir WALTER.	GATES, B. J.	SILCOCK, T. B.
*MCFADYEAN, Prof. Sir J.	HARRIS, JOSEPH	SMITH, FRED
ASHTON, T. W.	MANSELL, ALFRED	STANFORTH, Col.
BEHRENS, Major CLIVE	*MASTER OF FARRIERS	STRAKER, F.
BELL, JOHN	COMPANY	TANNER, E. C.
BROWN, DAVIS	MATHEWS, ERNEST	THORNTON, F. H.

* *Professional Members of Veterinary Committee not Members of Council.*

*Standing Committees.***Stock Prizes Committee.**

CARR, RICHARDSON (Chairman)	CHAPMAN, W. W.	REA, G. G.
NORTHBROOK, Earl of	CRUTCHLEY, PERCY	SHERWOOD, S. R.
HARLECH, Lord	FENWICK, E. GUY	SILCOCK, T. B.
BURRELL, Sir MERRIK R.	GRAVES, R. M.	SMITH, FRED.
GREENALL, Sir G.	GROOM, HUBERT	TANNER, E. C.
HAZLERIGG, Sir A. G.	HOBBS, ROBERT	TINDALL, C. W.
ASHTON, T. W.	HOWKINS, B.	TURNER, A. P.
BEHRENS, Major CLIVE	MANSFELD, ALFRED	WICKHAM-BOYNTON, T. L.
BROCKLEBANK, Rev. C. H.	MATHEWS, ERNEST	The Stewards of Live Stock
BROWN, DAVIS	MYATT, JOHN	
	OVERMAN, HENRY	

Judges Selection Committee.—Same as Stock Prizes Committee.

Implement Committee.

STANFORTH, Lt.-Col. (Chairman)	FALCONER, J.	OVERMAN, HENRY
AVELING, T. L.	GARRETT, Col.	PATTERSON, R. G.
BELL, JOHN	GRAVES, R. M.	RANSOME, E. C.
BURKE, U. ROLAND.	HARRISON, W.	SAMPLE, C. H.
COURTHOPE, Lt.-Col. G. L.	HOWKINS, B.	SHERWOOD, S. R.
CRUTCHLEY, PERCY	LUDDINGTON, J. L.	WHEELER, Col.
EVENS, JOHN	MIDDLETON, C.	The Steward of Implements
	MYATT, JOHN	

Showyard Works Committee.

GREENALL, Sir G. (Chairman)	BELL, JOHN	OVERMAN, HENRY
BURRELL, Sir MERRIK R.	BURKE, U. ROLAND	REA, G. G.
HAZLERIGG, Sir A. G.	CARR, RICHARDSON	SAMPLE, C. H.
ASHTON, T. W.	CRUTCHLEY, PERCY	STANFORTH, Lt.-Col.
AVELING, T. L.	HARRISON, W.	TINDALL, C. W.
	NEILSON, R. B.	

Committee of Selection and General Purposes.

PARKER, Hon. C. T. (Chairman)	AULWYN, Lord	COURTHOPE, Lt.-Col.
THE PRESIDENT	HARLECH, Lord	GRAVES, R. M.
	HAZLERIGG, Sir A. G.	

And the Chairman of each of the Standing Committees.

Dairy and Produce Committee.

MATHEWS, ERNEST (Chairman)	DICKIE, ROBERT	SILCOCK, T. B.
BLEDISLOE, LORD	DISBROW-WISE, Col.	SMITH, FRED.
PARKER, Hon. C. T.	EVENS, JOHN	SOMERVILLE, Prof.
BURRELL, Sir MERRIK R.	FENWICK, E. GUY	WHEELER, Col.
ASHTON, T. W.	GRAVES, R. M.	WHETHAM, C. D.
CARR, RICHARDSON	OLIVER-BELLASIS, Capt R.	WILLIAMS, Prof. R.
CRUTCHLEY, PERCY	OVERMAN, HENRY	STENHOUSE
	PLUMPTRE, H. F.	

Horticultural Committee.

GREENALL, Sir G. (Chairman).	HAZLERIGG, Sir A. G.
------------------------------	----------------------

Research Committee.

DEVONSHIRE, Duke of (Chairman)	CORNWALLIS, Col.	OVERMAN, HENRY
BLEDISLOE, Lord	EVENS, JOHN	SOMERVILLE, Prof. W.
BURRELL, Sir MERRIK R.	HOBBS, ROBERT	WHETHAM, C. D.
ADEANE, C.	LUDDINGTON, J. L.	
	MATHEWS, ERNEST	

General Leicester Committee.

The Whole Council, with the following representatives of the Local Committee:—

THE MAYOR OF LEICESTER	KAYE, ROBERT W.	PRITCHARD, H. A.
EVERARD, W. LINDSAY	MARTIN, COL. R. E., C.M.G.	(<i>Town Clerk and</i>
FLINT, ALD. SAMUEL	SNOW, COUNCILLOR H. C.	<i>Local Secretary</i>)
HAYR, W. T.	TURNER, ALFRED	

Honorary Director.—SIR GILBERT GREENALL, Bart., C.V.O.

Secretary.—T. B. TURNER, 16 Bedford Square, W.C.1.

Editor of Journal.—C. S. ORWIN, M.A., *School of Rural Economy, Oxford.*

Consulting Chemist.—DR. J. AUGUSTUS VOELCKER, M.A., 1 Tudor St., E.C.4.

Consulting Veterinary Surgeon.—Prof. SIR JOHN McFADYEN, *Royal Veterinary College, Camden Town, N.W.1.*

Botanist.—Prof. R. H. BIFFEN, F.R.S., *School of Agriculture, Cambridge.*

Zoologist.—CECIL WARMURTON, M.A., *School of Agriculture, Cambridge.*

Consulting Engineer.—F. S. COURTNEY, 25 Victoria Street, Westminster, S.W.1.

Surveyor.—CHARLES H. R. NAYLOR, *Smith's Bank Chambers, Derby.*

Publisher.—JOHN MURRAY, 50a Albemarle Street, W.1.

Solicitors.—GARRARD, WOLFE, GAZE & CLARKE, 13 Suffolk Street, S.W.1.

Bankers.—WESTMINSTER BANK, 1 St. James's Square, London, S.W.1.

vi *Distribution of Governors and Members of the Society.*

DISTRIBUTION OF GOVERNORS AND MEMBERS OF THE SOCIETY, AND OF ORDINARY MEMBERS OF THE COUNCIL.

ELECTORAL DISTRICT	DIVISION	NUMBER OF GOVERNORS AND MEMBERS	NUMBERS OF ORDINARY MEMBERS OF COUNCIL	ORDINARY MEMBERS OF COUNCIL
A.	BEDFORDSHIRE	120	1	B. Hawkins.
	CHESHIRE	817	3	G. P. Min; R. B. Neilson; Major C. W. Tomkinson.
	CORNWALL	113	1	Capt. G. H. Johnstone.
	DERBYSHIRE	208	2	U. Roland Burke; Lt. Col. H. T. D. Disbrow-Wise.
	DORSET	118	1	A. Hiscock.
	HAMPSHIRE AND CHANNEL ISLANDS	360	2	T. W. Ashton; J. Falconer.
	HERTFORDSHIRE	249	1	Richardson Carr.
	LANCASHIRE AND ISLE OF MAN	469	2	W. Harrison; T. B. Silcock.
	MIDDLESEX	106	1	A. W. Perkin.
	MONMOUTHSHIRE	100	1	Col. Edward Currie.
	NORFOLK	507	3	Davis Brown; Hubert Groom; Henry Overman.
	NORTHAMPTONSHIRE	236	1	F. H. Thomson.
	NORTHUMBERLAND	645	3	G. G. Bea; C. H. Sample; F. Straker.
	STAFFORDSHIRE	317	2	John Myatt; R. G. Patten.
	WORCESTERSHIRE	215	1	Col. E. V. V. Wheeler.
	YORKSHIRE, N.R.	321	2	Major Olive Behrens; J. H. Twentyman.
	SCOTLAND	306	2	Robert Dickie; A. M. Montgomery.
		—5,107	—29	
	BUCKINGHAMSHIRE	182	1	H. J. Gates.
	DETON	204	1	Lord Midmay of Flete.
B.	DURHAM	368	2	W. Burdett; C. Middleton.
	ESSEX	318	2	Sir Walter Gilbey; Hon. E. G. Strutt.
	HEREFORDSHIRE	184	1	A. P. Turner.
	LEICESTERSHIRE	231	1	Sir A. G. Haslerigg.
	LONDON	584	3	W. W. Chapman; F. P. Mowbray; F. Hamlyn Price.
	NOTTINGHAMSHIRE	223	1	John Bell.
	RUTLAND	40	1	E. Guy Fenwick.
	SHROPSHIRE	402	2	Alfred Mansell; E. Craig Taper.
	SUFFOLK	346	2	S. R. Sherwood; Fred Smith.
	SURREY	238	1	Major Dunbar Kelly.
	WILTSHIRE	221	1	D. Combes.
	YORKSHIRE, W.R.	400	2	Lt.-Col. G. R. Lane-Fox; C. Howard Taylor.
	SOUTH WALES.	180	1	Col. C. Venables Llewelyn.
		—4,109	—32	
	BERKSHIRE	209	1	Sir W. A. Mount.
	CAMBRIDGESHIRE	337	2	Rev. C. H. Brocklebank; J. L. Luddington.
C.	CUMBERLAND	203	1	Joseph Harris.
	GLAMORGAN	150	1	H. D. Alexander.
	GLOUCESTERSHIRE	316	2	Lord Bledisloe; H. D. Brocklebank.
	HUNTINGDONSHIRE	58	1	Sir Douglas Newton.
	KENT	460	2	T. L. Aveling; H. F. Flampitt.
	LINCOLNSHIRE	456	2	John Evans; C. W. Tindall.
	OXFORDSHIRE	219	1	Robert Hobbs.
	SOMERSET	193	1	Lord Strachan.
	SUSSEX	426	2	Sir Merrick R. Burrell; Lt.-Col. G. L. Courtois.
	WARWICKSHIRE	284	1	Capt. E. Oliver-Bellasis.
	WESTMORLAND.	99	1	Lord Henry Bentinck.
	YORKSHIRE, E.M.	182	1	T. L. Wickham-Baynton.
	IRELAND	97	1	Right Hon. F. Wrench.
	NORTH WALES.	305	2	David Davies; Major E. J. W. Platt.
		—3,099	—22	
FOREIGN COUNTRIES		264		*Col. Frank Garrett.
MEMBERS WITH NO ADDRESSES		27		*E. C. Ransome.
				*Prof. W. Somerville.
GRAND TOTALS.		13,506	77	*C. Dampier Whetham.

* Nominated Members of Council.

TABLE SHOWING THE NUMBER OF GOVERNORS AND MEMBERS
IN EACH YEAR FROM THE ESTABLISHMENT OF THE SOCIETY.

Year ending with Show of	President of the Year	Governors		Members		
		Life	Annual	Life	Annual	Total
1830	3rd Earl Spencer	—	—	—	—	1,100
1840	6th Duke of Richmond	86	169	140	2,434	5 2,860
1841	Mr. Philip Pusey	91	219	241	1,047	7 5,395
1842	Mr. Henry Hanley	101	211	328	5,194	13 5,840
1843	4th Earl of Hardwicke	94	209	429	6,155	15 6,902
1844	3rd Earl of Hardwicke	95	214	442	6,161	16 6,927
1845	5th Duke of Richmond	94	198	357	6,559	15 6,733
1846	1st Viscount Portman	92	201	354	6,103	19 6,971
1847	6th Earl of Egmont	91	195	367	5,478	20 6,301
1848	2nd Earl of Yarborough	83	186	348	5,387	21 6,335
1849	3rd Earl of Chichester	89	173	382	4,943	20 5,201
1850	4th Marquis of Downshire	90	169	627	4,356	19 5,312
1851	5th Duke of Richmond	91	162	674	4,175	19 4,961
1852	2nd Earl of Dudley	93	156	711	4,062	19 4,925
1853	2nd Lord Ashburton	90	147	730	3,878	19 4,777
1854	Mr. Philip Pusey	88	146	771	4,162	20 4,882
1855	Mr. William Miles, M.P.	89	141	782	3,838	20 4,979
1856	1st Viscount Portman	87	139	839	3,820	19 4,968
1857	Viscount Okeington	83	137	836	3,951	19 5,161
1858	6th Lord Bereres	81	133	901	4,010	18 5,161
1859	7th Duke of Marlborough	78	130	927	4,008	18 5,161
1860	4th Lord Walsingham	72	119	957	4,017	14 5,163
1861	3rd Earl of Powis	84	90	1,115	3,528	18 4,823
1862	(H.R.H. The Prince Consort)	83	97	1,151	3,475	17 4,823
1863	1st Viscount Portman	80	88	1,293	3,745	17 5,183
1864	Viscount Eyresey	78	45	1,347	4,613	17 5,406
1865	2nd Lord Faversham	79	81	1,289	4,120	16 5,752
1866	Sir E. C. Kerleson, Bart., M.P.	79	81	1,255	4,949	15 5,465
1867	1st Lord Trevelyan	77	82	1,288	3,962	15 5,465
1868	Mr. H. S. Thompson	75	74	1,409	3,888	15 5,401
1869	6th Duke of Richmond	75	73	1,417	3,864	17 5,446
1870	H.R.H. The Prince of Wales, K.G.	74	74	1,511	3,761	15 5,448
1871	6th Lord Vernon	72	71	1,580	3,866	17 5,648
1872	Sir W. W. Wynn, Bart., M.P.	71	71	1,655	3,963	14 5,768
1873	2nd Earl Cathcart	74	62	1,842	3,936	12 5,910
1874	Mr. Edward Holland	76	68	1,911	3,756	12 5,848
1875	Mr. Edward Holland	79	79	2,168	3,918	11 6,145
1876	1st Viscount Blandford	83	78	2,164	4,013	11 6,319
1877	2nd Lord Chesham	81	76	2,229	4,072	17 6,460
1878	Vol. Kingscott, C.B., M.P.	75	75	2,328	4,130	26 7,032
1879	H.R.H. The Prince of Wales, K.G.	71	72	2,458	4,700	26 7,392
1880	6th Duke of Bedford	83	70	2,673	5,083	50 7,929
1881	Mr. William Wells	85	60	2,765	5,041	19 7,979
1882	Mr. John Dent Hunt	82	72	2,849	5,050	19 8,060
1883	6th Duke of Richmond and Gordon	78	71	2,970	4,952	19 8,009
1884	Sir Braithwaite Gibbs	72	72	3,203	5,408	51 8,776
1885	Sir M. Lores, Bart., M.P.	71	60	3,336	5,619	20 9,133
1886	H.R.H. The Prince of Wales, K.G.	70	61	3,414	5,649	20 9,134
1887	Lord Egerton of Tatton	71	64	3,440	5,387	20 8,982
1888	Sir M. W. Ridley, Bart., M.P.	66	56	3,521	5,235	16 8,984
1889	Drs Manservy Queen Victoria	73	55	3,567	7,133	15 10,866
1890	Lord Mordaunt	122	68	3,846	6,541	17 10,364
1891	2nd Earl of Havensworth	117	60	3,811	6,921	19 10,328
1892	1st Earl of Faversham	111	60	3,784	7,066	20 11,050
1893	1st Duke of Westminster, K.G.	107	74	3,780	7,158	21 11,126
1894	5th Duke of Devonshire, K.G.	113	73	3,798	7,212	22 11,248
1895	Sir J. H. Thorold, Bart.	120	80	3,747	7,170	23 11,140
1896	Sir Walter Gilbey, Bart.	126	89	3,685	7,253	23 11,110
1897	H.R.H. The Duke of York, K.G.	126	83	3,705	7,285	24 11,223
1898	6th Earl Spencer, K.G.	121	79	3,687	7,183	25 11,094
1899	Earl of Coventry	116	75	3,656	7,009	23 10,873
1900	H.R.H. The Prince of Wales, K.G.	111	71	3,628	6,832	24 10,656
1901	3rd Earl Cardor	102	70	3,564	6,523	27 10,913
1902	H.R.H. Prince Christian, K.G.	100	69	3,490	6,562	26 10,950
1903	H.R.H. The Prince of Wales, K.G.	99	62	3,439	5,771	27 9,988
1904	5th Earl of Derby, K.G.	96	68	3,375	5,496	32 9,477
1905	6th Lord Middleton	89	78	3,212	5,258	33 8,176
1906	Mr. F. S. W. Cornwallis	94	153	3,132	6,140	30 9,500
1907	Earl of Yarborough	91	174	3,076	6,299	29 9,669
1908	Duke of Devonshire	89	174	3,010	6,412	30 9,758
1909	7th Earl of Jersey, O.C.B.	91	177	2,951	6,636	31 9,446
1910	Sir Gilbert Greenall, Bart.	86	166	2,878	6,954	51 10,005
1911	His Majesty King George V.	85	168	2,905	7,191	30 10,279
1912	6th Lord Middleton	85	170	2,741	7,284	30 10,345
1913	Earl of Northbrook	89	168	2,691	7,471	26 10,220
1914	Earl of Powis	89	173	2,620	7,629	28 10,545
1915	Duke of Portland, K.G.	88	184	2,517	7,313	28 10,120
1916	7th Duke of Richmond and Gordon, K.G.	83	185	2,427	7,240	27 10,218
1917	Mr. Charles Adcock, C.B.	93	210	2,412	8,214	26 10,955
1918	Hon. Cecil T. Parker	102	224	2,395	8,226	25 10,672
1919	Sir J. B. Rose Jones, Bart.	119	236	2,411	8,558	24 11,348
1920	H.R.H. The Prince of Wales, K.G.	120	250	2,402	9,264	25 12,020
1921	Mr. R. M. Graves	137	275	2,374	10,606	24 12,046
1922	H.R.H. The Duke of York, K.G.	144	287	2,317	10,599	22 13,366
1923	1st Col. E. W. Stanforth	153	293	2,282	10,774	20 13,506

STATEMENT made to the Council by the Chairman of the Finance Committee, on presenting the Accounts for the year 1923.

Mr. ADEANE said he had the pleasure of laying before the Council the accounts for the year ended December 31, 1923, which he hoped they would consider satisfactory. The figures were all set out clearly and in detail in the papers which were in the hands of members of Council present, and also the corresponding figures for last year, so that he need only touch on a few salient points. Taking the credit side, the total ordinary receipts were £17,480, life compositions, etc., £1,652, and they had brought forward a balance from 1922 of £3,188, making the total receipts £22,320. On the debit side the total of ordinary payments was £14,497, and other payments, including investments made during the year, £4,454, giving total payments amounting to £18,951. This left a credit balance at the end of the year of £3,369.

With regard to the balance sheet there was only one thing to which he would refer, and that was that the reserve fund at the end of the year stood at £111,005. (Applause.)

Coming to the forecast of ordinary receipts and expenditure, they estimated that the receipts would be £17,809 and the ordinary expenditure £13,081. In addition the Committee recommended under the head of exceptional expenditure that £2,000 be again voted for scientific research, for painting and repairs to the Society's house £246, for library binding and purchase of books £100, and a sum, which he regretted was rather a large one, for legal expenses £1,000. That was in connection with their appeal with regard to taxation on show surpluses. So that the total estimated receipts were £17,809 and the estimated expenditure £16,427, which showed an estimated credit balance of £1,382.

The accounts and balance-sheet were then adopted, together with the estimate for the ensuing year, which was as follows:—

FORECAST OF ORDINARY RECEIPTS AND EXPENDITURE FOR 1924.
(Other than in respect of the Show.)

Prepared by direction of the Finance Committee on the basis of the recommendations of September 21, 1925, made by the Special Committee.

Actual Figures for 1923.		Receipts.	£
11,921	From Subscriptions for 1924 of Governors and Members		11,920
365	From Interest on Daily Balances		288
3,814	From Interest on Investments		5,063
433	From Sales of Journals, Text-Books, Pamphlets, etc.		464
236	Advertisements in Journal		230
477	Income Tax Repaid		
41	Miscellaneous		
204	N.D.D. Entry Fees, etc.		
17,481			

£	Expenditure.	£
2,788	Salary of Secretary and Official Staff	3,815
323	Pensions to Officials	323
336	Rent, Lighting, Cleaning, Wages, etc. (say)	1,000
737	Printing and Stationery	800
308	Postage and Telegrams	350
303	Miscellaneous	400
1,499	Journal	2,000
417	Chemical Department	420
250	Botanical Department	250
200	Zoological Department	200
233	Veterinary Department	403
100	Grant to Research Institute, University College, Reading	100
100	Consulting Engineer	100
215	Examinations for National Diploma (R.A.S.E. share)	220
3,500	Amount set aside towards loss on Shows	3,500
11,909		13,081
	<i>Exceptional Expenditure.</i>	
2,000	Scientific Research	2,000
518	Painting and Repairs to Society's House (say)	246
70	Library Binding and Purchase of Books	100
	Legal Charges (say)	1,000
11,497		16,227
	Estimated Receipts	117,809
	Estimated Expenditure	116,427
	Credit balance:	
2,081	Estimated Receipts over Expenditure	1,382

X

STATEMENT OF RECEIPTS AND EXPENDI.

JULY 3 To

Corresponding Date for 1922		Receipts.	£	s	d.	£	s	d.
2,000		Subscription from the City of Newcastle-on-Tyne				2,500	0	0
3,527		Prizes given by Agricultural and Breed Societies and others	3,416	5	6			
984		Prizes given by Newcastle Local Committee	1,440	0	0			
						4,856	5	6
4,511		Contributions to Show Fund				120	12	4
		FEES FOR ENTRY OF IMPLEMENTS:—						
12,199		Implement Exhibitors' Payments for Shedding	12,530	18	6			
365		Non-Members' Fees for Entry of Implements	313	2	0			
168		Fees for Entry of "New Implements"	156	0	0			
						13,000	0	6
12,732		FEES FOR ENTRY OF LIVE STOCK:—						
20		4 Members' Entries @ 5l.				—		
6,425		By 1,731 Members' Entries @ 3l.	5,193	0	0			
6		2 Members' Entries @ 2l.	4	0	0			
2,681		1,718 Members' Entries @ 30s.	2,577	0	0			
381		337 Members' Entries @ 1l.	337	0	0			
27		64 Members' Entries @ 15s.	48	0	0			
38		31 Members' Entries @ 10s.	15	10	0			
19		106 Members' Entries @ 5s.	26	10	0			
12		Entrance fees	73	2	0			
594		102 Non-Members' Entries @ 6l.	612	0	0			
231		42 Non-Members' Entries @ 3l.	126	0	0			
2		3 Non-Members' Entries @ 2l.	6	0	0			
—		5 Non-Members' Entries @ 1l.	5	0	0			
1		1 Entry @ 10s.	10	0	0			
1		2 Entries @ 5s.	10	0	0			
						9,021	2	0
10,548		FEES FOR ENTRY OF POULTRY:—						
138		By Members:—606 Entries @ 5s.	141	10	0			
321		By Non-Members:—620 Entries @ 10s.	310	0	0			
9		Entrance fees	2	0	0			
						452	10	0
468		OTHER ENTRY FEES:—						
84		Produce	170	0	0			
90		Rabbitry	63	0	0			
138		Horse-jumping Competitions	97	0	0			
11		Plantation Competition	26	4	6			
13		Orchard and Fruit Plantation Competition	23	10	0			
						396	14	6
336		CATALOGUE:—						
		Extra Lines for Particulars of Implement						
24		Exhibits	10	12	0			
17		Woodcuts of "New Implements"	7	10	0			
793		Advertising in Catalogue	1,078	17	8			
44		Sales of Implement Section of Catalogue	35	18	4			
1,965		Sales of Combined Catalogue	2,242	17	3			
65		Sales of Jumping Programme	57	0	9			
						3,442	16	0
2,902		Less Commission on Sales	78	2	2			
69						3,364	13	8
2,833								
£33,428		Carried forward				£33,715	18	1

TURE OF THE SHOW AT NEWCASTLE-ON-TYNE, JULY 7, 1923.

		Expenditure.			
		COST OF ERECTION OF SHOWYARD:—			
				£	s. d.
		Transferring Society's Permanent Buildings from Cambridge to Newcastle (including taking down and re-erecting)		2,721	2 3
3,057		Fencing round Showyard		1,504	7 2
1,504		Implement Shedding		3,057	3 2
3,057		Stock Shedding		8,278	13 6
11,015		Poultry and Produce Sheds		610	1 7
617		Rabbit Shed		98	18 0
78		Dairy		533	19 7
575		Fodder Shed and Office		137	6 10
163		Education and Forestry		303	9 7
370		Grand Stands and Large Ring		1,198	4 7
1,013		Various Offices and Stands		1,221	5 2
1,380		Painting Signs and fixing do., Fencing and Judging Rings		750	13 5
969		Insurance		70	16 6
74		Ironmongery		63	16 5
23		Hire of Canvas		3,860	1 11
4,413		Provision for Renewal of Timber		1,500	0 0
1,500		General Labour and Horse Hire (including Society's Clerk of Works)		1,904	14 10
1,299		Bee Shed		44	15 5
33		Extra Entrance to Show		42	14 8
435		Horse-Shoeing Shed		89	17 1
94				24,437	1 8
39,737		Less Cost of Railway Carriage		734	7 9
40		50 Flagpoles @ 10s.		40	0 0
				824	7 2
39,697				27,612	13 11
SURVEYOR:—					
699		Salary, 450l.; Travelling Expenses to London, 35l. 3s. 6d.; Clerk, 10l. 10s.; Petty Cash, 6l. 15s.			502 8 6
PRINTING:—					
917		Printing of Prize Sheets, Entry Forms, Admission Orders, Circulars to Exhibitors, Prize Cards, Tickets and Miscellaneous			900 5 10
38		Programmes for Members			27 17 9
21		Plans of Showyard			7 11 0
1,662		Printing of Catalogues			1,706 16 11
241		Binding of Catalogues			316 4 8
32		Carriage of Catalogues			36 2 5
15		Printing Awards			49 8 11
28		Programmes of Jumping Competitions			32 5 0
					3,076 12 6
2,988		ADVERTISING:—			
140		Advertising Closing of Entries in Newspapers			179 3 6
237		Advertising Show in Newspapers			342 8 0
67		Bill Posting			214 12 2
251		Printing of Posters			58 14 0
10		Press Pamphlet			7 14 0
7		Carriage			—
					821 11 8
728		POSTAGE, CARRIAGE, & C.:—			
107		General Postage			169 8 10
67		Postage of Badges to Members			68 16 4
12		Carriage of Luggage			22 4 1
					260 9 8
276		AMOUNT OF PRIZES AWARDED, including 4,550l. 5s. 6d. given by various Societies and Newcastle Local Committee			
11,547					11,768 0 6
COST OF FORAGE FOR LIVE STOCK:—					
2,051		Hay, 596l. 10s. 1d.; Straw, 834l. 0s. 6d.; Green Food, 403l. 5s. 0d.; Commission and Travelling Expenses, 50l.; Extra Carriage and other expenses, 57l. 0s. 6d.			1,933 13 1
JUDGES' FEES AND EXPENSES:—					
771		Judges of Miscellaneous Implements, 24l. 10s. 6d.; Horses, 115l. 18s. 6d.; Cattle, 207l. 1s. 3d.; Sheep, 203l. 3s. 8d.; Pigs, 88l. 12s. 2d.; Goats, 5l. 1s. 0d.; Poultry, 24l. 3s. 8d.; Rabbits, 18l. 8s. 0d.; Produce, 41l. 14s. 0d.; Luncheon, 93l. 18s. 0d.			826 19 9
83		Badges for Judges and other Officials			70 10 6
78		Rosettes			92 7 11
549,918		Carried forward			146,985 7 7

STATEMENT OF RECEIPTS AND EXPENDITURE

Corresponding figures for 1922

Receipts (contd.).

£		£	s.	d.	£	s.	d.
33,428	Brought forward				33,715	18	8
MISCELLANEOUS RECEIPTS:—							
888	Admission to Horticultural Show	1,512	5	3			
965	Garage	694	4	6			
157	Rent for Railway Offices	147	17	6			
60	Premium for Cloak Rooms	60	0	0			
120	Rent for Ministry of Agriculture Pavilion	130	0	0			
192	Advertisements in Stock Prize Sheet	167	14	9			
135	Sale of Old Entrances	—					
27	Sale of Manure	20	0	0			
7	Miscellaneous	17	2	9			
25	Bath Chairs	19	1	3			
2,576					2,768	6	8
ADMISSIONS TO SHOWYARD:—							
1,654	Tuesday, July 3, @ 10s.	1,751	0	0			
5,386	Wednesday, July 4, @ 5s.	9,252	14	6			
4,638	Thursday, July 5, @ 3s.	8,755	7	8			
3,100	Friday, July 6, @ 3s.	6,241	10	6			
1,349	Saturday, July 7, @ 2s.	3,925	12	5			
564	Season Tickets	1,691	17	0			
203	Day Tickets	831	14	0			
16,885					32,383	16	7
ENTRANCES TO HORSE RING:—							
337	Wednesday, July 4	595	17	6			
248	Thursday, July 5	457	10	0			
206	Friday, July 6	347	10	0			
131	Saturday, July 7	245	6	0			
810	Tickets sold for Reserved Enclosure	964	12	9			
1,732					2,613	10	3
SALES:—							
178	Sales of Produce at Dairy	214	6	8			
877	Auction Sales in Showyard (Share of Commission)	649	13	10			
	Outstanding Receipts from Cambridge Show.	27	5	1			

£35,676

£72,479 2 7

Examined, audited and found correct, this 20th day of Nov., 1923.

T. B. TURNER, Secretary.
DELOITTE, PLENDER,
GRIFFITHS & CO., Accountants.JONAS M. WEBB, {
H. J. GREENWOOD, { Auditors on behalf
NEWELL, P. SQUAREY, { of the Society.

OF THE SHOW AT NEWCASTLE-ON-TYNE (continued).

		£	s.	d.	£	s.	d.
47-948	Brought forward				48,965	7	7
	GENERAL ADMINISTRATION:—						
175	<i>Stewards:—</i> Personal and Railway Expenses	180	11	6			
215	<i>Assistant Stewards:—</i> Personal and Railway Expenses	263	18	6			
	<i>Office Staff:—</i> Extra Clerks, 270 <i>s.</i> 0 <i>s.</i> 4 <i>d.</i> ; Gravities to Staff, 253 <i>s.</i> ; Lodgings, 40 <i>s.</i> 10 <i>s.</i> 0 <i>d.</i> ; Maintenance of Clerks, 35 <i>s.</i> 10 <i>s.</i> 6 <i>d.</i> ; Travelling Expenses, 39 <i>s.</i> 19 <i>s.</i> 2 <i>d.</i> ; Secretary's Hotel and Travelling Expenses, 160 <i>s.</i> 11 <i>s.</i> 2 <i>d.</i>	817	9	8			
201	<i>Finance Office:—</i> Finance Clerks, 2 <i>s.</i> 1 <i>s.</i> 8 <i>d.</i> ; Grand Stand Men, 70 <i>s.</i> 11 <i>s.</i> 8 <i>d.</i> ; Parkside Men, 70 <i>s.</i> 10 <i>s.</i> 0 <i>d.</i> ; Bank Clerks, 42 <i>s.</i> 10 <i>s.</i> 6 <i>d.</i> ; Refreshments, 10 <i>s.</i> 0 <i>s.</i> 2 <i>d.</i>	237	14	0			
50	<i>Awards Office:—</i> Clerks, 42 <i>s.</i> 0 <i>s.</i> 8 <i>d.</i> ; Boys, 15 <i>s.</i> 0 <i>s.</i> 0 <i>d.</i>	57	0	8			
1,110					1,565	14	4
	General Management:—						
180	Foreman and Assistant Foremen	203	2	10			
99	Yardmen	60	9	9			
186	Door and Gate Keepers	170	19	7			
101	<i>Garage:—</i> Superintendent and Assistants	114	19	4			
128	<i>Veterinary Department:—</i> Veterinary Inspectors	123	14	6			
122	<i>Engineering Department:—</i> Consulting Engineer and Assistant, 11 <i>s.</i> 0 <i>s.</i> 6 <i>d.</i> ; House, Maintenance and Travelling Expenses, 44 <i>s.</i> 7 <i>s.</i> 10 <i>d.</i>	161	8	4			
922	<i>Police, &c.:—</i> Metropolitan Police, 1,177 <i>s.</i> 5 <i>s.</i> 11 <i>d.</i> ; Commissionaires, 20 <i>s.</i> 0 <i>s.</i> 0 <i>d.</i> ; Refreshments, 5 <i>s.</i> 12 <i>s.</i>	1,202	17	11			
1,800					2,937	12	3
	Dairy:— Staff, 281 <i>s.</i> 19 <i>s.</i> 7 <i>d.</i> ; Milk, 190 <i>s.</i> ; Ice, 2 <i>s.</i> ; Utensils, 180 <i>s.</i> 3 <i>s.</i> 0 <i>d.</i> ; Salt, 1 <i>s.</i> 15 <i>s.</i> ; Engine, 1 <i>s.</i> 2 <i>s.</i> ; Butter Tests, 32 <i>s.</i> 10 <i>s.</i> 9 <i>d.</i> ; Carriage, 1 <i>s.</i> 18 <i>s.</i> 5 <i>d.</i> ; Lodgings, 30 <i>s.</i> ; Labour, 34 <i>s.</i> 11 <i>s.</i> 4 <i>d.</i> ; Milk Analysis, 12 <i>s.</i> ; Purchase of Cheese 3 <i>s.</i> ; Refreshments, 32 <i>s.</i> 8 <i>s.</i> 9 <i>d.</i> ; Fuel, 4 <i>s.</i> 17 <i>s.</i> ; Miscellaneous, 42 <i>s.</i> 7 <i>s.</i> 4 <i>d.</i>	965	13	8			
10	Analysis of Gider	6	10	0			
10	<i>Poultry:—</i> Penning and Feeding, 90 <i>s.</i> 4 <i>s.</i> 5 <i>d.</i> ; Labour, 13 <i>s.</i> 17 <i>s.</i> 6 <i>d.</i> ; Carriage, 21 <i>s.</i> 15 <i>s.</i> 9 <i>d.</i> ; Miscellaneous, 3 <i>s.</i> 10 <i>s.</i> 0 <i>d.</i>	129	7	8			
10	<i>Rabbits:—</i> Penning and Feeding 22 <i>s.</i> 10 <i>s.</i> ; Carriage 6 <i>s.</i> 8 <i>s.</i> 0 <i>d.</i>	28	18	0			
1,086					1,068	9	4
	Horticultural Show:— Hire of Tents, 459 <i>s.</i> 14 <i>s.</i> 2 <i>d.</i> ; Judges, 32 <i>s.</i> 7 <i>s.</i> 4 <i>d.</i> ; Wages, 63 <i>s.</i> ; Medals, 43 <i>s.</i> ; Printing, 3 <i>s.</i> 17 <i>s.</i> 6 <i>d.</i> ; Sand, 11 <i>s.</i> 4 <i>s.</i> 1 <i>d.</i> ; Labour, 2 <i>s.</i> 2 <i>s.</i> 9 <i>d.</i> ; Carriage and Carriage, 22 <i>s.</i> 13 <i>s.</i> 1 <i>d.</i>	673	13	11			
770	(For Admissions see Miscellaneous Receipts.)						
51	Plantation Competition	78	12	5			
28	Orchard and Fruit Plantation Competition	58	6	10			
	GENERAL SHOWYARD EXPENSES:—						
13	Telephone Extension	8	15	4			
30	Telegraph Facilities	13	5	6			
203	Hire of Furniture	279	10	0			
204	<i>Hire of Chairs</i>	—					
58	Official Luncheons	88	2	6			
69	St. John Ambulance	50	0	0			
39	Maps and Plans	42	7	6			
17	Medals	10	5	6			
35	Lino and Flags	88	1	4			
13	Education and Forestry	29	4	4			
13	Gas	5	6	9			
11	Banner	—					
53	Sleepers	11	18	0			
19	Pillposting in Showyard	11	15	0			
9	Hire of Pony and Trap	4	10	0			
19	Hire of Bath Chairs	22	10	0			
10	Taxi	7	15	0			
—	Asbes	10	17	6			
13	Carriage	10	8	1			
28	Engraving Cups	39	17	9			
33	<i>Repairs to Lorry</i>	—					
3	Hire of Weighbridge	11	1	3			
13	<i>Hire of Tents</i>	—					
—	Stable Lanterns	14	1	9			
48	Miscellaneous	53	3	3			
826					868	19	4
30	Outstanding accounts from Cambridge Show	65	10	9			
53,519					53,877	11	9
57	Credit Balance	19,101	11	2			
£55,676					£72,479	2	11
	Actual surplus on the Newcastle Show				£19,101	11	2
	Less—Contribution from the Ordinary Account to Show Fund				3,500	0	0
					£22,601	11	2

STATEMENT OF RECEIPTS AND

Figures for 1923 £	Receipts.	£ s. d.	£ s. d.	£
	CASH AT BANKERS AND IN HAND AT JANUARY 1, 1923 :—			
506	Reserve Fund		442	2 2
3465	Current Account		2,643	9 11
70	Cash in Hand		102	6 9
4,041				3,187 1
	ANNUAL SUBSCRIPTIONS :—			
1,424	Governors for 1923	1,505	5 0	
10,114	Members' Subscriptions for 1923	10,153	13 5	
154	Subscriptions for 1923 (additional)	137	0 0	
59	Subscriptions for previous years	81	1 0	
	LIFE GOVERNORS AND MEMBERS :—			
47	Annual Contributions	43	15 0	
11,798			11,920	14 5
	MISCELLANEOUS :—			
3,295	Income from Investments	3,813	17 11	
126	Interest on Daily Balances	565	8 3	
1,210	Income Tax repaid	477	7 8	
103	Sales of Pamphlets, Farm Account Books &c.	90	19 3	
3	Library Catalogues			
319	Sales of Text Books	227	11 10	
128	Sales of Journals	94	13 9	
275	Advertisements in Journal	235	17 6	
—	N.D.D.: Entry Fees and Sales of Papers	204	4 6	
21	Sundries	40	19 0	
5,480			5,559	10 8
17,278	Total of Ordinary Receipts			17,489 1
	LIFE COMPOSITIONS :—			
1,327	Governors and Members	1,113	0 0	
160	Legacy			
51	Donation to Society's Funds	50	0 0	
915	Sales at Woburn Farm			
87	Subscriptions for 1924	68	12 0	
399	Cash received for debts due at Dec. 31, 1922	419	18 11	
24,758				
	Miscellaneous	0	8 10	1,651 1
71,042	Sale of War Stock			
	Rent, 12 Hanover Square	247	10 0	
	Less Rent paid	247	10 0	
195,390				121,320 1

T. B. TURNER, *Secretary.*DELOITTE, FLENDER, GRIFFITHS & CO., *Accountants*

PAYMENTS FOR THE YEAR 1923.

xv

		Payments.					
		£	s.	d.	£	s.	d.
GENERAL ADMINISTRATION :—							
5,547	Salaries of Official Staff (including clerical assistance)	2,787	13	0			
418	Pensions to Officials	322	12	1			
404	Legal Charges and Auditors' Fees	94	6	0			
907	Rent, Rates, Taxes, Insurance and House Expenses	936	8	9			
6	Purchase of Books	9	11	0			
753	Printing and Stationery	737	4	7			
322	Postage and Telegrams	308	0	2			
44	Carriage of Parcels and Travelling Expenses	22	2	10			
187	Advertising and Miscellaneous Office Expenses	145	4	7			
1,770					5,363	3	0
JOURNAL OF THE SOCIETY :—							
Balance cost of Volume 83 :—							
1,331	Printing and Binding	966	16	7			
215	Postage	295	1	4			
220	Editing and Literary Contributions	229	2	0			
18	Illustrations	8	9	11			
1,734					1,499	9	10
5	On account of printing Volume 84				4	2	0
106	Printing Pamphlets				17	2	10
87	Printing Farm Account Books						
	Advertising Farm Account Books				9	12	6
LABORATORY :—							
423	Salary and Petty Cash				416	12	3
OTHER SCIENTIFIC DEPARTMENTS :—							
260	Botanist's Salary	250	0	0			
200	Zoologist's Salary	200	0	0			
100	Consulting Engineer	100	0	0			
200	Grant to Royal Veterinary College	200	0	0			
100	Grant to Research Institute, Reading	100	0	0			
3	Medals for Proficiency in Cattle Pathology	2	19	6			
253					832	19	6
NATIONAL DIPLOMA IN AGRICULTURE :—							
413	Honoraria and Expenses of Examiners	366	19	11			
104	Travelling Expenses of Officials	101	14	3			
107	Hotel Expenses of Examiners and Officials	89	17	5			
135	Printing, Stationery and Postage	91	6	0			
24	Writing Diplomas	26	18	6			
—	Hire of Premises	8	18	6			
75	Salary for Assistant	75	0	0			
206		760	14	7			
6,68	Less Entry Fees and Sales of Examination Papers	649	5	8			
21		111	8	11			
11	Less Highland and Agricultural Society's Moiety	55	14	6			
20					55	14	5
NATIONAL DIPLOMA IN DAIRYING :—							
17	Hire of Premises, etc.	29	14	5			
20	Fees to Examiners	98	17	11			
20	Hotel and Travelling Expenses	43	18	9			
31	Printing and Postage	16	18	0			
102					189	9	1
171	For Entry Fees and Sales of Exam. Papers, see contra.						
EXTRA EXPENDITURE :—							
2,000	Grant to Research Fund	2,000	0	0			
22	Library: Binding and Purchase of Books	79	9	0			
—	Painting and Cleaning Society's House	418	0	6			
—	Alterations to Lighting Installations	69	17	6			
2,092		2,588	13	0			
3,500	Amount set aside towards Loss on Shows	3,500	0	0			
14,437	Total of Ordinary Payments				14,496	18	11
21,473	Purchase of £5,185 10s. 11d. Conversion Loan 3½ per cent. @ 7½ per cent.	3,957	4	5			
1,299	Purchase of Marble Pedestal	87	12	4			
279	Payment to Willesden District Council	459	19	6			
1,294	Payments to Creditors				4,454	16	3
BALANCES AT BANK AND IN HAND :—							
447	Reserve Fund	132	17	9			
2743	Current Account	3,080	9	5			
792	Cash in Hand	155	10	4			
3,981		3,368	17	8			
1,299		£22,350	12	8			

Examined, audited and found correct, this 21st day of February, 1924.

JONAS M. WEBB, { Auditors on
H. J. GREENWOOD, { behalf of
the Society.

ROYAL AGRICULTURAL

Dr.

BALANCE SHEET

Figures for 1922		£ s. d.	£ s. d.	
6	To SUNDRY CREDITORS—			
303	Sundry Creditors		274 4 0	
86	Subscriptions received in 1923, but belonging to 1924		68 12 0	
				342 0
389				
3,000	To Amount set aside for renewal of Show Timber			1,251 0
83,061	To CAPITAL—			
	As at December 31, 1922		94,954 12 2	
	Add			
	Show Fund—			
57	Surplus on Newcastle-on-Tyne Show	19,101 11 2		
3,500	Contribution from Ordinary Account	3,500 0 0		
	New Entrances to Show	2,558 13 10		
3,557			25,860 5 0	
4,675	Profit on sale of War Stock			
1,377	Life Compositions received in 1923		1,113 0 0	
915	Sales at Woburn			
11	Donations towards the Society's Funds		50 0 0	
160	Legacy			
80	Subscriptions for 1923 received in 1922		83 11 0	
	Appreciation on Investments		374 19 7	
	Unclaimed account transferred		35 0 0	
2,837	Excess of ordinary receipts over payments for the year 1923		2,983 15 2	
			125,455 2 11	
96,613				
212	Less sundry debts			
96,451				
	DEPRECIATIONS written off, viz. :—			
1,193	Investments.			
14	Fixtures	13 2 1		
48	Furniture	44 17 0		
8	Machinery	7 12 4		
133	Show Plant	119 13 9		
100	Lease of 16 Bedford Square	100 0 0	285 5 2	
1,406				125,171
94,955				

T. B. TURNER, *Secretary.*

DELOITTE, PLENDER, GRIFFITHS & CO., Accountants

SOCIETY OF ENGLAND.

DECEMBER 31, 1923.

xvii

Cr.

	£	s.	d.	£	s.	d.
By RESERVE FUND—						
191,294l. 0s. 11d. Conversion Loan $\frac{3}{4}$ per cent. (1901) @ 70 $\frac{1}{2}$ *	59,847	14	10			
500l. War Savings Certificates @ present value	500	0	0			
3,992l. 16s. Local Loans 3 per cent. (1912) @ 64 $\frac{1}{2}$ *	2,521	16	5			
2,840l. 13s. 6d. Metropolitan 3 per cent. Consol- dated Stock (1941) @ 79 $\frac{1}{2}$ *	2,258	6	8			
6,523l. 1s. 6d. Canadian 4 per cent. Stock (1940-1960) @ 88 $\frac{1}{2}$ *	5,777	6	11			
* Market value at 31 Dec., 1923.				111,005	4	10
By LEASE OF 16 BEDFORD SQUARE	1,400	0	0			
Less Amount written off	100	0	0			
				1,300	0	0
By FIXTURES—						
Value at December 31, 1922	174	15	3			
Less Depreciation at 7 $\frac{1}{2}$ per cent.	13	2	1			
				161	13	2
By FURNITURE—						
Value at December 31, 1922	448	10	3			
Less Depreciation at 10 per cent.	41	17	0			
	403	13	3			
Added during 1923	37	12	4			
				441	5	7
By PICTURES (500l.) and BOOKS (1,071l. 4s. 10d.)				1,571	4	10
By MACHINERY—						
Value at December 31, 1922	76	3	10			
Less Depreciation at 10 per cent.	7	13	4			
				68	11	6
By SHOW PLANT—						
Value at December 31, 1922	1,196	17	10			
Less Depreciation at 10 per cent.	119	13	9			
	1,077	4	1			
Added during 1923	3,476	6	10			
				4,553	10	11
By EXPENDITURE ON FORTHCOMING SHOW AT LEICESTER				1,965	18	6
By SUNDRY DEBTORS				653	7	6
By CASH AT BANKERS AND IN HAND— ORDINARY ACCOUNT—						
Reserve Fund	132	17	9			
Current Account	3,089	9	5			
Cash in Hand	155	10	4			
	3,368	17	6			
SHOW ACCOUNT—						
On Deposit	1,290	0	0			
Current Account	467	5	10			
	1,657	5	10			
				5,036	3	4
				£128,757	0	2

Examined, audited, and found correct, this 21st day of February, 1924.

JONAS M. WEBB, { Auditors on
H. J. GREENWOOD, { behalf of
the Society.

Royal Agricultural Society of England.

RESEARCH COMMITTEE.

RECEIPTS AND PAYMENTS FOR YEAR 1923.

RECEIPTS.		PAYMENTS.	
	£ s. d.		£ s. d.
To Cash at Bankers, Jan. 1st, 1923.	902 18 0	By Honorarium for writing report on Whey	50 0 0
" Interest on current account relating to 1922	15 10 3	" Grant to the Norfolk Agricultural Station for Cereal Experiments	500 0 0
" Grant from Society's Funds	2,000 0 0	" Grant to the National Institute of Agricultural Jodary for Yield Trial on Oats	131 0 0
" Cash received from Mr. A. E. Mearsh in connection with Pig Feeding Experiments conducted at Harper Adams Agricultural College	500 0 0	" Grant to the Leicestershire County Council in connection with Grassland Experiments	160 0 0
" Cash received from sale of Pigs in connection with Pig Feeding Experiments conducted at Harper Adams Agricultural College	400 0 0	" Cash advanced in connection with Pig Feeding Experiments at Harper Adams Agricultural College	700 0 0
		" Grant to School of Agriculture, Cambridge, for Pig Feeding Experiments	500 0 0
		" Grant to East Suffolk County Education Committee for Silage Experiments	50 0 0
		" Patent relating to Treatment of Whey	41 0 6
		" Books	1 10 0
		" Travelling Expenses	2 15 6
		" Balance at Bankers, December 31, 1923	1,783 2 3
	<u>£5,000 8 3</u>		<u>£5,000 8 3</u>

Examined, audited, and found correct, this 21st day of February, 1924.

T. B. TURNER, *Secretary*.

DELOTTE, BLENDER, CHUTEAU & CO., *Accountants*.

JONAS M. WEBB, *(Auditors on behalf of the Society)*
H. J. GREENWOOD,

Global Agricultural Society of England.

STATEMENT OF FUNDS HELD BY THE SOCIETY IN TRUST OR WHICH ARE NOT CONSIDERED AVAILABLE FOR GENERAL PURPOSES, DECEMBER 31, 1923.

To Hills' Request for Pot-culture Experiments	£	s.	d.
Less: Amount of Consols at time of conversion	9,000	0	0
" Cost of conversion	3,482	11	7
	3,717	2	6
	5,282	17	6

To Fund provided by the late Sir Walter Gilbey for Endowment of Lectureship at Cambridge when after a certain date any balance on this account will become the property of the Society . . . 1,191 5 3

To Superannuation and Insurance Fund :—	£	1,191	5	3
Amount set aside in accordance with Resolution of Trust of July 26, 1911	£	s.	d.	
Less: Depreciation of Consols at time of conversion	9,171	5	0	
" Cost of conversion	1,837	18	4	
	256	3	0	
Add: Purchase of 1,307½ 14s. 9d. 5% War Loan at cost	2,094	1	4	
	7,077	3	8	
	1,107	0	0	
	8,244	3	8	
Income Tax payable on War Stock	338	11	9	
Accumulation to December 31, 1923	931	2	0	
	£9,483	17	10	

Examined, audited, and found correct, this 21st day of February, 1924.
T. B. TURNER, Secretary
D'ARLOTTIE, PLENDER, GRIFFITHS & CO., Accountants.

By 5,600½ 17s. 8d. 5% War Stock (1923-1947) received under the conversion rights for 5,282½ 17s. 6d. 4½% War Stock . . . 5,282 17 6
(Value on December 31, 1923, at 100½ = 5,607½ 10s. 8d.)

By 1,140½ Metropolitan Water A Stock at cost (Value on December 31, 1923, at 100½ = 1,140½ 10s. 0d.)	998	1	0
By amount included in the Society's Statement of Creditors' Account :—	£	s.	d.
Fund uninvested	1	19	0
Accumulated income	191	5	3
	193	4	3
	£1,191	5	3

By Investments in names of Trustees of Superannuation and Insurance Funds, viz :—
8,817½ 7s. 1d. 5% War Stock (1923-1947) at cost (Value on December 31, 1923, at 100½ = 8,828½ 7s. 6d.)
44½ 10s. 1d. West Australian 3½% Stock (1935-1955) at cost . . . 369 17 4
(Value on December 31, 1923, at 75½ = 333½ 10s. 1d.)
342½ 13s. 8d. Queensland 3½% Stock (1930-1970) at cost . . . 234 15 6
(Value on December 31, 1923, at 70½ = 241½ 11s. 10d.)
Cash at Bank . . . 615 1 4

£9,483 17 10

[Copies of the full Report of any of the Council Meetings held during the year 1923 may be obtained on application to the Secretary, at 16 Bedford Square, London, W.C.1.]

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Minutes of the Council.

WEDNESDAY, JANUARY 31, 1923.

LT.-COL. E. W. STANYFORTH (President), in the Chair.

LT.-COL. STANYFORTH, on taking the Chair for the first time, once more thanked the Council for the great honour they had done him in electing him President.

Since their last meeting—the President continued—H.R.H. the Duke of York had become betrothed to Lady Elizabeth Bowes-Lyon, and he felt sure it would be the wish of them all that he should voice their feelings and the feelings of the Governors and Members of the Society by tendering their congratulations to their patron, H.M. the King, and also to the Duke of York, on his engagement. His Royal Highness had been their last president, and had fulfilled his duties exceedingly well. He thought he would not be overstepping the mark when he said it was largely due to His Royal Highness's presence at the Cambridge Show that there had been a balance in the Society's favour instead of a deficit. His Royal Highness's work for the Society last year would increase their desire for his future prosperity. Anticipating their wishes, he had ventured to have letters drafted to Lord Stamfordham and to H.R.H. the Duke of York.

The terms of these letters were approved, and the President was authorized to sign them on behalf of the Council.

One item of information he had to give them—the President added—was that H.R.H. the Prince of Wales had graciously signified his intention of being present at the Newcastle Show: the Duke of Northumberland had kindly asked His Royal Highness to stay at Alnwick for the occasion. He did not think the Prince had been to Newcastle before, and, if anything were needed to make the Show there a success, he was perfectly certain that the visit of His Royal Highness would ensure that success.

Nine new Governors and 131 new Members were admitted into the society.

On the presentation of the Report of the COMMITTEE OF SELECTION, SIR DOUGLAS NEWTON said he had listened with close attention, and had endeavoured to appreciate the various recommendations made in the report. He found that it was extremely difficult with a verbal report to catch all the points and adequately to weigh up all its recommendations. He hoped to have the privilege of raising this question by a motion at the next meeting of the Council.

Regarding the four points he had raised at the last meeting, as far as he was able to gather the idea of offering hospitality to visitors from overseas had met with the approval of the Committee, and they were going to get into touch with the Colonial Office, the Foreign Office, and the Ministry of Agriculture. Might he also suggest that they should get in touch with the Overseas Trade Department, which was linked with the Foreign Office? He hoped that the question of interpreters would also be dealt with in connection with that matter.

With regard to the catalogue, if it were found impossible to "step" the

edges, he would like to suggest that more use should be made of coloured papers.

He understood that the Committee saw many objections to the installation of a tramway in the showyard, but he was of opinion that there would also be great advantages from it. He would like to know if the views of the Newcastle Committee had been obtained, and if any representatives of the trade had been consulted as to its practicability.

Regarding his fourth point, he understood that the Committee could not see their way to make any recommendation. Agriculturists at the present time were faced with a double difficulty, firstly in growing their produce, and secondly in selling it; therefore anything in the nature of advertisement for their wares was a definite help. He could not help feeling that it was a great reproach on them as the premier agricultural body in the country, that they should allow foreign produce to be sold at their Show. He therefore moved :—

"That this Council is of opinion that all food, fruit, and drink supplied on the Show Ground which can be produced commercially in England, should be of English production, and accordingly requests the Committee concerned to take all necessary and practicable steps to give effect to this resolution."

Mr. OVERMAN seconded the resolution, and said he wished that Sir Douglas Newton had devoted the whole of his energies to the last paragraph, because he thought it a most important recommendation. Every agricultural organization at the present time was approaching the Government to try to make them use home-grown meat for the Army on home stations, and, personally, he was hopeful that they were going to win on that question. But if a national institution like the "Royal" permitted foreign meat and German lager beer to be sold to the public in its showyard, he did not think the agriculturists would stand much chance in approaching the Government to induce them to buy home-grown produce for the Army.

Sir GILBERT GREENALL explained that nothing could be done, because the Society were bound by contract with the caterers until 1924. Mr. Harrison and himself had had endless difficulties in connection with the Show catering. He agreed entirely with Mr. Overman, but they must get the catering job done, and in making a new contract it would be difficult to find any one to touch it if such conditions were imposed.

Mr. WILLIAM HARRISON emphasized what Sir Gilbert had said, but he was also entirely in sympathy with Sir Douglas Newton and Mr. Overman in their desire that everything should be done to provide English-grown produce. Perhaps they might put the question to the caterers and see what they had to say. Notwithstanding the fact that they had a contract which did not terminate until 1924, they might be able to get an undertaking that the caterers would utilize as far as possible home-grown produce.

Mr. J. D. WALKER, Chairman of the Stewards Committee of the Freemen of Newcastle, referring to the suggestion for the installation of a light tramway in the showground, said that he was quite sure that the Freemen would strongly object to such a thing, because it would be necessary to cut up the Moor to a great extent and would involve the expenditure of a large amount for reinstatement, that would be absolute waste of money. He was quite certain that the Freemen would object, and he thought it only right that the Council should be made aware of this.

Mr. OLIVER, Town Clerk of Newcastle, said that the question of extending the city tramway into the showyard had been considered, but it had been turned down by the Tramways Manager as absolutely impracticable.

The PRESIDENT, dealing with Sir Douglas Newton's remarks, said that the Council had always extended hospitality to foreigners coming to the Show, who had been entertained and looked after. He knew some foreigners had in the past arrived and had not been identified, but that was a thing that might occur again. In future, efforts would be made by the Council to afford greater hospitality to foreigners and visitors from Over-

seas. With regard to the catalogue, the reason for not "stepping" the edges was that unless they had a stiff binding this would be almost impossible, and if they had a stiff binding it would add to the expense. It would also necessitate the use of a better paper. The Committee did not really think it necessary. As to the tramway suggestion, the difficulties arising would far surpass the benefits, and they had just heard from a member of the Local Committee that it would be impossible to instal such a tramway on the Town Moor at Newcastle. As to the resolution moved by Sir Douglas Newton, they had all heard the discussion that had taken place. Last year very little fruit had been available at the time of the Show, but in most years he thought there had been plenty available in the showyard. His own experience, at any rate, was that there had always been a large amount of fruit for sale.

Mr. ADRANE said he thought they would all like to compel everybody in this country to consume what was produced here, but he understood that the Council was bound by contract to the caterers until 1924. Mr. Harrison, however, had made the useful suggestion that he and Sir Gilbert Greenall should interview the caterers to see if they could persuade them to provide more English meat, fruit, and other produce. He thought they might adopt that suggestion.

Sir GILBERT GREENALL undertook to do his best with the caterers, but he was afraid he could hold out no hope that he would be able to induce them to adopt the suggestion.

Sir DOUGLAS NEWTON, in reply to the President, said that as long as the Committee would treat the matter sympathetically he was quite prepared to withdraw his resolution.

The PRESIDENT said he was quite sure that the matter would receive the careful attention of Sir Gilbert Greenall and Mr. Harrison.

The resolution having, by consent, been withdrawn, the report of the Committee of Selection was then received and adopted.

Mr. John Bell, representing Nottinghamshire, and Mr. E. Craig Tanner, representing Shropshire, were present for the first time. The PRESIDENT extended to them a welcome on behalf of the Council, and expressed the hope that they would devote as much time as possible to the interests of the Society.

WEDNESDAY, MARCH 7, 1923.

LT.-COL. E. W. STANYFORTH (President) in the Chair.

The PRESIDENT, before proceeding with the business of the Council, said it was his sad duty to have to refer to the deaths of two gentlemen who were at one time officials of the Society. Sir Ernest Clarke, who had been Secretary of the Society from 1887 to 1905, died on Sunday last. Anticipating the Council's wishes, he had instructed the Secretary to send to the late Sir Ernest's brother a letter of condolence in his loss. There were not many of those present who were serving on the Council during Sir Ernest's secretaryship, but those who were would remember his great courtesy, kindness, and charm of manner. He was an accomplished and clever man, interesting to talk to on any subject, and during his term of office had spared no pains to do everything in his power for the Society. A memorial service was being held that morning, and, but for the Council meeting, he had no doubt that it would have been attended by many of those present. However, he was thankful to say that he had persuaded Colonel Wheeler, who was now the oldest ordinary member of the Council, to represent the Society.

He had also to refer to the death of Mr. J. R. Naylor, whose connection with the Society as Surveyor was of more recent date. Mr. Naylor had served the Society for sixteen years from 1906 to December last. His death

occurred on February 5th, and the Secretary represented the Society at his funeral. He was sure the Council would all join with him in expressing to Mr. Charles Naylor their great appreciation of his late father's services, and their sense of the loss he and the Members of his family had sustained.

One new Governor and 84 new Members were admitted into the Society.

The PRESIDENT took the opportunity of saying a word about new members. They would all agree, he thought, that their membership roll was their great and most secure banking asset, and therefore it was very necessary that this should be kept up. He was going to send out, as was usual for the President, a circular letter, but if individual members of the Council as well as the Trustees and Vice-Presidents, would help him in regard to this he would be grateful. He asked them really to try to get, say, ten members each during the ensuing year. He did not think that members realized how much more valuable individual effort was in this matter than the ordinary letter. If members of the Council would give him their assistance, he was perfectly certain that the result would be a large increase in the membership.

The Report of the FINANCE Committee was received and adopted, together with the Accounts and Balance Sheet for 1922, and the Estimates for the current year, as to which a statement was made by Mr. ADEANE. There was naturally, Mr. ADEANE added, a desire to see the charges connected with the show reduced, and this would be carefully considered in the autumn, but the Society would have to proceed cautiously. The Council had been fully justified in the line it took in 1919 and 1921, when the charges were put up, and they had had a fair test in the show at Cambridge. If the charges at Cambridge had been pre-war the loss would have been £18,371. If they had been the same as at Darlington the loss would have been £10,806. As it was, the latest scale of charges enabled the show to give a profit of only £57.

Sir GILBERT GREENALL said with regard to entry fees that no one was more anxious than he to see these cut down, but the first thing the Society would have to do would be to relieve the breed societies. He knew that many of those societies now found it a matter of great difficulty to give the present large sums for increased classification. Therefore, before they talked of reducing entry fees they must first consider the question of reducing the contributions of the breed societies.

The PRESIDENT said they had heard a most interesting statement from Mr. Adeane, and he thought they should all bear those facts in mind when talking over, outside, the question of reducing entry fees. He hoped those figures would become very public in order to show the enormous difference they made.

In presenting the Report of the CHEMICAL Committee, Lord BLEDISLOE made reference to the recent death of Mr. F. J. Lloyd, at one time senior assistant in the Society's laboratory. Mr. Lloyd had done valuable work during his lifetime as an agricultural chemist.

In presenting the Report of the VETERINARY Committee, the EARL OF NORTHBROOK called attention to two matters of serious importance. The first was the recent landing of a cargo of feeding stuffs from the s.s. *Hartington*, which had been contaminated while on board by cattle infected by foot-and-mouth disease; and the second was whether the Ministry of Agriculture proposed to take any steps to give effect to the recommendations contained in the report of the Departmental Committee on Foot-and-Mouth Disease. Lord Mildmay had kindly undertaken to make inquiries regarding these matters, and the Council would, he was sure, be interested to hear his Lordship's report.

Lord MILD MAY OF FLETE then stated what had transpired in an interview he had had with Captain Pretzman, who had been Chairman of the Departmental Committee on Foot-and-Mouth Disease. As to the recommendations of that Committee, Captain Pretzman was absolutely satisfied

with the action of the Ministry of Agriculture, who, he said, had dealt with the whole matter most expeditiously and most efficiently. What Captain Pretymann had told him had later been confirmed by an official of the Ministry. When at Whitehall Place, his Lordship said he had also gone into the very serious question of the steamer *Hartington*.

Having favoured the Council with an account of his interview with the Ministry's representative, Lord MILDMAY added that the Ministry had been most prompt in dealing with this matter, and, in his opinion, it was only their promptitude that had saved the situation.

After some discussion—in which Mr. MIDDLETON, Sir MERRIK BURBELL, Lord MILDMAY, Lord NORTHBROOK, and Sir DOUGLAS NEWTON took part—the following resolution was unanimously passed:—

"The Council of the Royal Agricultural Society of England have heard with grave concern of the occurrence of the *s.s. Hartington* disembarking a cargo of flour and mill-lings in the Port of London which had been contaminated whilst on board by cattle and sheep infected by foot-and-mouth disease.

"In view of the fact that the amendment of the Diseases of Animals Bill is now under consideration, the Council of the Royal Agricultural Society of England urge that a regulation should be inserted into the Bill to prevent the possibility of any recurrence of such incident, and respectfully suggest that no grain, offals from cereals, or other cattle food shall be permitted into Great Britain off a ship which has during the ninety days previous carried cattle, sheep, or pigs from a country in which foot-and-mouth disease is endemic.

"The Council desire to take this opportunity of expressing their appreciation of the vigilance and prompt action of the Ministry's officials in dealing with the danger arising from the cargo of the *s.s. Hartington*.

Sir GILBERT GREENALL said that Mr. Harrison and himself had seen the caterers regarding the food sold in the showyard, and Mr. Christopher had expressed his anxiety to meet the wishes of the Council as far as possible. He could not, of course, say that the flour from which the bread was made or the eggs from which the cakes were made were produced at home, but, as far as possible, he was anxious to do what he could.

The SECRETARY then read a letter from Messrs Letheby and Christopher on this subject.

Sir DOUGLAS NEWTON said he thought that Sir Gilbert's explanation, with the letter that had been read, met his views.

The Report of the COMMITTEE of SELECTION was received and adopted, including a recommendation that a Committee, consisting of the President, the Hon. Director, the Chairman of the Committee of Selection, Lord Ailwyn, Lord Bledisloe, Mr. Adeane, Colonel Cornwallis, and Mr. Mathews, be appointed to consider and report on the question of the Bye-Laws and Standing Orders for the procedure at Council and other meetings.

Lord BLEDISLOE, in presenting the Research Committee's Report, said there were two matters to which he would refer. One was with regard to the patents taken out in connection with the whey investigations. There had been some misunderstanding outside regarding these, but the sole idea of the Society was to prevent a monopoly. It was very necessary that these discoveries should be commercially exploited, but it was neither necessary nor desirable that dairy farmers or cheese-makers should be exploited. The other matter was with regard to the offer made by Mr. Ernest Marsh. Perhaps he ought to explain that a very large proportion of the pigs fed for bacon and sent to the factories was not of the quality or description best adapted for bacon production. Mr. Marsh had offered a contribution of no less than £1,000 towards experiments with pigs. Mr. Marsh was Chairman of Messrs. Marsh and Baxter and of Messrs. Harris of Calne.

Mr. FALCONER was pleased that this matter had been brought up and that Mr. Marsh had agreed to provide the money for such an experiment. He (Mr. Falconer) happened to be on the managing committee of a bacon factory, and their manager had complained very seriously about so much inferior bacon being sent in to kill. He understood that at the present

time 46 per cent. of the pigs they received could not be turned into Al bacon.

The SECRETARY reported that the following notice of motion had been received from Sir Douglas Newton, and that in accordance with By-law No. 30 it would be considered at the meeting of the Council to be held upon April 11th, 1923. Members were requested to accept this as the formal one month's notice of such motion in accordance with the before mentioned by-law:—

"That an *ad hoc* committee be appointed to consider the practicability of the circulation of the Minutes of Standing Committees prior to presentation to the Council."

On a motion from the Chair, the seal of the Society was affixed to an agreement with the Local Authority of Chester for the holding of the Show in that city in 1925.

Letters were read from the Home Secretary and Wing-Commander Louis Greig acknowledging the addresses of congratulation on the occasion of the betrothal of H.R.H. the Duke of York.

Sir DOUGLAS NEWTON made reference to the Imperial Exhibition to be held in 1924, at which, he said, agriculture would be a prominent feature, and asked if the Society had been approached in the matter.

The PRESIDENT replied that he understood there was to be an agricultural section, the principal feature of which would be live stock. The breed societies had, he believed, been approached, but not the Royal Agricultural Society.

Sir DOUGLAS NEWTON then suggested that the Society should get into touch with the Exhibition authorities with a view to it being represented in some form. He had only raised the matter with the object of obtaining information.

The PRESIDENT said he was sure the Council were obliged for the suggestion, and promised that the matter should be looked into.

WEDNESDAY, APRIL 11, 1923.

LT.-COL. E. W. STANYFORTH (President) in the Chair.

One new Governor and 124 new Members were admitted into the Society.

The Report of the VETERINARY Committee was presented, including the following resolution:—

"The Veterinary Committee of the Royal Agricultural Society of England recommend the Council of the Society to strongly oppose any interference with the present regulations governing the export of horses as embodied in the Order of the Ministry of Agriculture dated the 21st December, 1921, and entitled the *Exportation and Transit of Horses, Asses, and Mules Order of 1921*, which are proving effective in their operation.

"In the event of any attempt being made to impose a tax upon horses exported they pledge themselves to oppose such attempt by all the means in their power, as it would prove most detrimental to the horse-breeding industry of the country."

A conference on the question of the export of horses for butchery had been held under the auspices of the R.S.P.C.A. on March 27.

Sir HERBIE BURRELL, who had attended this conference on behalf of the Royal Agricultural Society, gave the Council his views on the subject of the Bill which the R.S.P.C.A. propose should be enacted. It was—he said—in itself a matter of very grave importance, and it would not only do considerable harm to the work of the horse-breeding societies in the country, but had an influence on the already depleted source from which Army remounts were drawn. If the resolution were adopted, it would bring the Society into direct opposition to the R.S.P.C.A. When Lord Northbrook asked him to attend this conference, he had taken all possible steps to put himself in possession of full knowledge on the subject. He

had found that the suggested Bill proposed that a fee of £20 should be paid for the examination of all horses exported alive from any port of Great Britain to any port outside Great Britain, excepting horses under five years of age of a value of not less than £40, and horses certified to be registered in the recognized Stud Book of their breed of a value of not less than £40. All unfit horses rejected at the port of shipment were to be slaughtered without compensation to the owner. After reading the Regulations of the Ministry of Agriculture on this export trade, Sir Merrik said he had interviewed one of the officials who was responsible for the administration of those Regulations; and the further he had gone into the matter the more certain he became that the Bill was not only a bad Bill, but was quite an unnecessary one. When he attended the conference, which was composed of representatives of the R.S.P.C.A., representatives of all the horse-breed societies, and himself representing the "Royal," he had taken upon himself to oppose very strongly any such Bill. It had been laid down by several committees by which this matter had been considered, that the export of the cheap horse from this country was a matter essential to the welfare of horse-breeding. If breeders could not get rid of their misfits they could not go on breeding. In 1921 there were 47,770 horses exported. Of this number 92 per cent. were of the value of between £20 and £100, and only 320 horses were under a value of £20. The total value of the export trade was somewhat short of three millions, and this proposed Bill would most seriously interfere with that trade.

Having dealt with the history of the trade and the legislation from time to time, Sir Merrik said the R.S.P.C.A. admitted that the present regulations were good and were being efficiently carried out. The results of the restrictive control now exercised were remarkable. Shipments overseas of horses had been reduced by about 20 per cent. already, and the standard had been raised also to a very great extent. In 1921 only two horses were slaughtered at the ports, as against 284 in the previous year. At the ports of Hull, Coole, and Leith, in January and February—and these three ports were the most important ones that horses went from—in 1921, 3,676 horses were shipped, in 1922 that number had fallen to 816, and in 1923 it had fallen still further to 42. The slump in the trade for cheap horses in this country had enabled this class of horse to be exported at such a price that it gave a man a small profit on the Continent to buy the animals for slaughter. That trade would, however, decrease. Another point which showed that the Ministry's present regulations were quite sufficient without the proposed Bill was that the trade in dead horse carcasses to Belgium had increased in the past year by 30 per cent. and to France and Holland by approximately 300 per cent. in each case. The Ministry was also taking steps with the foreign Governments to facilitate and encourage the carcass trade. It was held by the R.S.P.C.A. that those horses were badly treated in transit, that they had no water or food, and so on. He would, however, assure the Council that a great many of these allegations were not true. All the horses that went to Antwerp and were bought for slaughter were taken to a quarantine station three and a half miles from the quay in charge of a police officer, and were there given water, a liberal allowance of hay, and also an allowance of bran, and when detained there overnight were provided with straw for bedding. As to the transit, the Ministry had laid down strict regulations which provided that proper protection should be given them from the weather, that they were not shipped during stormy weather, that the stable fittings were adequate, and that any fitting which might cause injury was padded. In fact, all the steps that could be taken were being taken, and he submitted to the Council that they had a perfectly good case in going in direct opposition to the R.S.P.C.A. in this matter. He very much hoped that in the interests of horse-breeding generally the Council would endorse the resolution of the Committee.

Sir WALTER GILBEY sincerely hoped that the Council would see their way to pass the resolution of the Veterinary Committee. The National Horse Association, on which body all the Horse Societies were represented, had unanimously decided to oppose this proposed Bill in every way, and they hoped that the Royal Agricultural Society would co-operate with them in doing so. As Sir Merrick Burrell had stated, it was a totally unnecessary Bill, and would inflict hardship on many breeders.

The Report of the VETERINARY Committee, including the resolution on this question, was then received and adopted.

On the motion of Sir DOUGLAS NEWTON, seconded by Sir ARTHUR HAZLERIGG, it was resolved :—

"That an *ad hoc* Committee be appointed to consider the practicality of the circulation of the Minutes of Standing Committees prior to presentation to the Council."

It was further resolved, on the motion of Mr. MANSELL, seconded by Mr. BURKE, that this *ad hoc* Committee should consist of the Chairmen of each of the Standing Committees with the addition of Sir Douglas Newton and Sir Arthur Hazlerigg.

Lord STRACHIE moved :—

"That the Council declares its emphatic protest against the reported proposal of the Minister of Agriculture to admit Canadian cattle for breeding purposes as being most detrimental to the live stock of Great Britain."

This resolution was seconded by Sir MERRICK BURRELL, and passed unanimously after several members had spoken in its support.

WEDNESDAY, MAY 2, 1923.

Lt.-Col. E. W. STANYFORTH (President) in the Chair.

Twelve new Governors and 121 new Members were admitted into the Society.

The Report of the FINANCE Committee was received and adopted, after the following statement had been read to the Council by Mr. Adeane :

A demand has now been made on the Society from the taxation authorities to levy income tax on the show surpluses, and the Council must determine on what course to take. This is the first time in the history of the Society that such a demand has been made.

A few years ago the Society appealed against the taxation of its income from ordinary sources, and was granted an exemption on the ground that its work was of an educational character, and could rightly come under the charitable clauses of the Finance Act. The claim now put forward is under Schedule D, and the show is treated as a business. To this we demur on the following grounds :—

1. That the show is educational in every sense of the word, and the Society, in holding its annual exhibition of stock and of implements, is not carrying on a trade or business but merely the intentions of its founders as expressed in the Royal Charter.

2. Any show surplus goes to the reserve and the income derived from it is used for educational purposes. The members of the Society receive no pecuniary gain from any surplus. The fact that the show is exempt from entertainment tax goes to prove that its nature is as stated.

It is not too much to say that but for the educational work done by the Society by means of its exhibitions, British stock would not hold the high position in the world that it does at present.

The Report of the GENERAL NEWCASTLE Committee having been received and adopted, Mr. G. G. REA referred to the invitation which had been received by the Council to visit the Cockle Park Experimental Station on Monday, July 2, the day previous to the opening of the Show at Newcastle-on-Tyne. As representing the Committee of Cockle Park, he said they would feel it a great honour if members of Council and any other members of the Society would pay them a visit. Cockle Park had taken a lead in agricultural matters in the country, and the Committee felt that they would like the whole Council to have an opportunity of visiting the station to see how things were carried on there.

The PRESIDENT stated that a board had been placed in that room in order that any members who would like to take advantage of this invitation might write their names down. The idea was that members should have lunch before leaving Newcastle, and, if it could be fixed at as late an hour as possible, he felt that more would go. He could recommend this to the Council as an opportunity of seeing some very interesting work, and hoped the very kind invitation would be accepted by as many as possible.

Mr. REA intimated that it would be quite possible to have an early lunch and start from Newcastle at 1.30 p.m.

The PRESIDENT added that the names of those wishing to attend should be put down by the next meeting of the Council on June 6, so that the necessary arrangements could be made in advance.

The Report of the VETERINARY Committee having been presented,

Mr. MANSELL made reference to a statement appearing in the press by the Medical Officer of Health of Manchester Port Sanitary Authority to the effect that although the cattle recently imported from Canada had "on the whole proved to be very healthy, they were not altogether free from pulmonary tuberculosis." He therefore moved that the Council call the attention of the Ministry of Agriculture to this statement and ask them to take all the steps they can to protect the live stock of this country.

This was seconded by Mr. MIDDLETON, and Sir GILBERT GREENALL, Sir MERRIK BURRELL, Mr. ADKINS, Lord STRACHIE, Mr. EVANS, and Mr. REA took part in the discussion which followed.

Mr. Mansell's resolution was then put to the Council and carried, and the report of the Veterinary Committee was adopted.

A report was submitted from the Committee appointed on April 11 "to consider the practicability of the circulation of the Minutes of Standing Committees prior to presentation to the Council." This, on the motion of the President, was received and adopted, including the following recommendation :—

That in future, to meet the suggestion of Sir Douglas Newton, the items of the different Committees should be amplified on the agenda issued to members of Council a week before the meeting; that the report of each Committee should be available for any member of Council to read at 9 a.m. on the morning of the Council meeting; and that notice should be printed on the agenda paper stating that the minute books would be available by 9 o'clock on the Council day if any members wished to look at them; further, that any important matter that has been raised by any Committee—at the discretion of that Committee or the Secretary—should be issued in the form of a special typewritten paper to members of Council on the morning of the Council meeting as early as possible before members took their seats in the Council Chamber.

In presenting the Report of the DAIRY AND PRODUCE Committee—which was received and adopted—Mr. MATHEWS made a statement regarding the visit paid last month to the Textile Department of Leeds University by Sir Merrik Burrell, Mr. Brocklebank, and himself, and appealed for the co-operation of the various Sheep Societies in a scheme for an investigation to be carried out at Leeds regarding different types of British Wools. Prof. Barker, of Leeds University—he said—wanted each Society to send him a fleece, unwashed, with skin complete, and also from 100 to 250 lb. of wool. He would then investigate the spinning and manufacturing possibilities of each of the wools supplied and prepare an exhibit, illustrative of the results obtained, for the Royal Show to be held at Leicester in 1924.

WEDNESDAY, JUNE 6, 1923.

LT.-COL. E. W. STANYFORTH (President) in the Chair.

The PRESIDENT said that, before proceeding with the business of the meeting, it was his sad duty to refer to the loss they had sustained by the death of Lord Chaplin, who had been a Governor since 1870, a member of the Council from 1872, and a Vice-President from 1889 to 1907. Members of Council would, he thought, all agree with the words used in a Sunday paper that Lord Chaplin was a typical English gentleman, pursuing the three great interests of agriculture, sport, and politics, and a man of influence, power, and absolute soundness. So much had been written regarding Lord Chaplin's connection with agriculture that he felt he need not say anything further. Presuming that they would wish it, he had had a letter written on behalf of the Council and sent to Lord Chaplin's son stating how much they regretted the loss of so typical a country gentleman. He would ask all present to express their regret in the usual way by rising in their places.

Two new Governors and 174 new Members were admitted into the Society.

The Report of the FINANCE Committee was received and adopted; and, on the motion of Mr. ADEANE, it was resolved—

"That the Secretary be empowered to issue to any duly nominated candidate for membership of the Society, on receipt of the annual subscription, a badge admitting the candidate to the same privileges as a member during the forthcoming Show at Newcastle-on-Tyne, the formal election of such candidate to be considered by the Council at their next ordinary meeting."

The PRESIDENT called attention to the invitation from Sweden for members of the Council to go over to the Gothenburg Exhibition. It had come somewhat late, and he was afraid it was rather difficult for most members of the Council to avail themselves of it. He, personally, had been asked to go, but he would be so busy between then and their own show that he felt he could not give up the eight or ten days necessary. He did, however, commend it most heartily to the Council as an opportunity for an extremely enjoyable and instructive trip. He did not even think it necessary for one to be away the whole time as the agricultural show was only open from June 19 to 24, but, at the same time, for anyone who was able to go they would doubtless like to see as much of Sweden as they could while there. A board for names of those wishing to go had been placed in the room, but up to the present he believed only Mr. Mansell and Sir Douglas Newton had decided to go. The Ministry of Agriculture, however, would be glad if the Society could, if possible, be more fully represented.

In presenting the Report of the RESEARCH Committee, Lord BLENDISLOE said there seemed to be some misunderstanding as to the scope and work of the Committee, but he hoped he might be allowed to say that it was not intended in any way to supplant the research institutes, but rather to supplement their work and form a bridge between research workers and the practical farmer. The experiments now in progress included a valuable experiment with barley being carried out in Norfolk; two Silage Experiments—one *clump* and the other *tower*; two pig-feeding experiments; and experiments on the feeding value and improvement of pastures in Leicestershire and Yorkshire.

With regard to Pig-feeding Tests, Mr. Marsh, as they knew, had generously contributed the sum of £1,000 towards these experiments, in order to demonstrate the value of home-grown foods for pig feeding. He thought they would agree with him that they should pass a very warm vote of thanks to Mr. Marsh for his munificence in this matter.

The vote of thanks to Mr. Marsh was unanimously accorded by the Council.

The SECRETARY announced that the Trustees of the Queen Victoria Gifts Fund had decided to make a grant of £140 to the Royal Agricultural Benevolent Institution for the year 1923, to be devoted to grants of £10 each in respect of male candidates, married couples, and female candidates, the actual distribution in each class to be left until after the election of pensions by the Royal Agricultural Benevolent Institution.

The PRESIDENT, referring to the proposed visit of Members of Council to the Cockle Park Experimental Station on Monday, July 2, said he was glad that several members had signified their intention of being present; any others who wished to take part in the visit should put their names on the board in that room, so that the necessary arrangements could be made. He was also pleased to see that a certain number were able to go to Cambridge after the Council meeting on August 1. He would be glad to see that list augmented.

Lord BLEDISLOE said the annual "field day" at Rothamsted would take place next Wednesday, and any members of the Council who would like to go would be most cordially welcomed.

WEDNESDAY, JULY 4, 1923.

LT.-COL. E. W. STANFORTH (President) in the Chair.

The Secretary read the awards of the Judges in the Orchards and Fruit Plantations Competition, which this year was confined to the counties of Kent, Surrey, and Sussex.

On the motion of the PRESIDENT, it was resolved:—

That the best thanks of the Society are due, and are hereby tendered to:—

- (1) The officials of the General Post Office for the efficient postal arrangements in connection with the show.
- (2) The Chief Commissioner of Police for the efficient services rendered by the detachment of Metropolitan Police on duty in the showyard.
- (3) The Chief Constable of Newcastle-on-Tyne for the efficient police arrangements in connection with the show.
- (4) The St. John Ambulance Brigade, No. VI (Northern) District, for the efficient ambulance arrangements in the showyard.
- (5) Messrs. Barclays Bank, Ltd., local bankers, for the efficient services rendered by their officials.
- (6) Messrs. Merryweather & Sons, Ltd., for the provision of fire protection appliances and for the efficient arrangements made by them in connection with the fire station in the showyard.
- (7) Messrs. Robson & Sons, Ltd., 42 Northumberland Street, Newcastle-on-Tyne, for decorating and furnishing the Royal pavilion.
- (8) Messrs. Wm. Fell (Hexham), Ltd., for providing floral decorations in the showyard.

Letters of thanks were also ordered to be sent to various other individuals and firms for assistance kindly rendered and for the loan of articles for the purposes of the show.

Mr. ADEANE mentioned the contents of a letter written to Capt. Petyman in connection with the Income Tax liability of the Society. This was a question, Mr. Adeane said, he thought would come forward quickly, and before the next meeting, and he would like to know what the views of the Council were. He thought the Society should fight this matter as hard as they could. The question was whether they should have a conference with other societies and all act together, or whether the Royal should fight the issue first. If unsuccessful, they could then call a meeting of representatives of other societies.

Mr. HARRISON believed the feeling of the Sub-Committee was that the Royal should fight by itself because of the time that would be lost in getting various societies together.

Mr. BUTCHLEY said that was his recollection also. There was the

further reason, too, that the cases of the R.A.S.E. and the other societies were not on all fours.

After some further discussion, it was resolved, on the motion of Mr. HARRISON, seconded by Mr. BROCKLEHURST, that power be given to the Sub-Committee to proceed with the appeal against the Income Tax assessment and that the Society act alone. The Sub-Committee was, however, given power to consult other societies if thought desirable.

A letter was read from Viscount Chaplin acknowledging the Council's expression of sympathy on the death of his father.

Proceedings at the General Meeting of Governors and Members,

HELD IN THE LARGE TENT IN THE SHOWYARD AT NEWCASTLE-ON-TYNE.

WEDNESDAY, JULY 4, 1923.

LT.-COL. E. W. STANYFORTH (PRESIDENT) IN THE CHAIR.

Resolution of Welcome.

THE PRESIDENT, in opening the meeting, said it was not possible to find words to express adequately the gratitude they all felt to His Royal Highness for coming there that day, but on behalf of the Council and of the Governors and Members he did thank him for his presence. It was not the only time that the Prince of Wales had helped the Royal Agricultural Society. The first time he came to the Show was in 1919 at Cardiff, and the success of that Show was enormously enhanced by his visit. In the following year they asked him to be President, and he most graciously accepted the invitation. But, alas, for the Royal Agricultural Society, his duties called him elsewhere, and their great and wonderful ambassador was obliged to go to the East. No doubt the Dominions gained a great deal, but the R.A.S.E. lost him as an actual President for 1920. They all sincerely hoped that the time was not far distant when His Royal Highness would again fill the office of President. (Applause.) Notwithstanding the extraordinarily strenuous life he lived, His Royal Highness had found time to come there this year and stay two or three days, and they felt that they owed him an extra debt of gratitude. It might interest those present to know that since 1862 twelve members of the Royal Family had acted as President. That testified to the amount of interest the Royal Family had always taken in the Society. It was not merely for visiting the Shows or for acting as President that the Society owed them such a deep debt of gratitude, but also for the noble example they set in the breeding of stock. He (the President) took that opportunity of congratulating His Royal Highness upon his success at the Show. Perhaps he would convey their congratulations, too, to His Majesty the King on the success he had had.

The PRESIDENT then proposed the following resolution:—

“May it please your Royal Highness:

“We, the Members of Council, Governors and Members of the Royal Agricultural Society of England, respectfully offer your Royal Highness a most loyal and hearty welcome to the Royal Show on the occasion of its visit to Newcastle-on-Tyne.

“We deeply appreciate the high ideals which prompt your Royal Highness's interest in Agriculture, as well as in other industries, and the keen and practical manner in which you demonstrate such interest which has earned the sincere affection of all people.

"We thank you for so graciously attending the Show and for your presence at this meeting, and trust that you may long be spared to continue to take such an active part in agricultural pursuits and your association with the country life of the nation; thus carrying on the traditions of your Royal House, which has been so closely identified with this Society since its foundation in the year 1839."

The DUKE OF RICHMOND AND GORDON re-echoed to the full what had been said by their President. They congratulated His Royal Highness, whose presence at the Show was very highly appreciated. It showed the interest their Royal visitor took in what they poor agriculturists still looked upon as the main industry of the country. (Hear, hear.) They met on that occasion on the borders of one of the largest manufacturing districts in Great Britain, and the combination of the two interests could not but tend to the benefit of both. They appreciated His Royal Highness's presence also because he had manifested his interest in agriculture, not only in this country, but wherever we had possessions abroad, by joining the band of farmers and breeders. They wished His Royal Highness all success in his farming efforts in America. Whether he would get at loggerheads with the authorities for the importation of Canadian cattle his Grace was unable to forecast. But, whatever happened, he could assure the Prince, now and always, of the warmest and heartiest sympathy of the mass of the farmers of the country. He cordially seconded the resolution.

The motion on being put to the meeting was carried with acclamation.

H.R.H. the PRINCE OF WALES, who, on rising, had a most enthusiastic reception, said:—

"Mr. President, My Lords, Ladies and Gentlemen,—It is very gratifying indeed to me to have been able to attend the Royal Show to-day and this General Meeting of the Members of the Society. I feel I must at once express my thanks for the very hearty welcome I have received and for the terms in which the resolution proposed by the President is couched.

"I am not altogether a stranger to the work of the Society, for, as many of you are aware, I had the pleasure of attending the Royal Show at Cardiff in 1919, the first Show held after the termination of the War, and it was only my absence abroad during the year of my Presidency of the Society which prevented me from being present at the Darlington Show of 1920."

"The President has given me some figures relating to the previous Shows held in this City in the years 1846, 1864, 1887, and 1908; they illustrate a marvellous record of progress, and I trust that the wishes of the Council that these records may be further eclipsed by the result of the Show of 1923 will be more than realized.

"The Society has been fortunate in securing such a splendid site for the Show, the largest area, I believe, in the history of the Society; their thanks are due not only to the Lord Mayor, Aldermen, and Citizens of Newcastle, but also to the Committee and Stewards and Wardens of the Freeman of the City. Their generosity in placing the site at the disposal of the Society is only another proof of the warm-hearted hospitality associated with the North.

"The entries in the Live Stock and the Implement Sections reflect great credit upon those concerned in their exhibition in view of the trying times through which Agriculture is passing.

"I, myself, am an exhibitor of stock, so that I can congratulate the successful exhibitors, and sympathize with the unsuccessful ones from my own personal experience. (Laughter.)

"The organization of the Show is, I think, a real triumph for all those concerned in its administration; man and beast, if I may put it so, have done their best, and if only the Clerk of the Weather will do *his* best during the remainder of the week, I am confident that the Show will prove the success which it deserves to be." (Applause.)

Five Newcastle Shows.

The PRESIDENT said it was usual on the occasion of that meeting to give a few figures with regard to past Shows in comparison with the present one. Five Shows had now been held at Newcastle-on-Tyne, viz.: In 1846, 1864, 1887, 1908, and 1923. No other city or town in this country could claim the honour of receiving the Society for its country meeting so often. In 1846 the financial result was a loss to the Society's funds of £2,138, in 1864 a gain of £1,342, in 1887 a loss of £2,029, and in 1908 a gain of £10,054. Might he venture to hope that when the accounts for the present Show were completed, the surplus attained on the 1908 Show might be exceeded and a new record in the annals of the Society created? In that year 213,867 persons paid for admission to the Show and, with the exception of the Manchester Show of 1897, this stood as a record. Was it too much to hope that the Manchester total would be exceeded and that Newcastle would again create a further record?

As a matter of interest and for comparative purposes, he found that in 1846 only three distinct breeds of cattle and four distinct breeds of sheep were exhibited, with a total of 183 cattle, 303 sheep, 54 agricultural horses, and 92 pigs. In 1864 there were nine distinct breeds of cattle, eleven breeds of sheep, and four of horses, with entries of 371, 417, and 159 respectively, whilst pigs of all breeds had an entry of 136. In 1887 still further progress was made both as regards the number of breeds exhibited and the entries. On that occasion there were 626 cattle, 513 sheep, 500 horses, and 194 pigs. In 1908 the number had increased to seventeen breeds of cattle with an entry of 948; twenty breeds of sheep with an entry of 695; sixteen breeds of horses with an entry of 644; and five breeds of pigs with an entry of 312. On this occasion the prize money offered was £10,560.

This year the prize money in all sections amounted to £14,750. There were twenty breeds of cattle with an entry of 1,185; seventeen breeds of horses with an entry of 641; twenty-two breeds of sheep with an entry of 728; ten breeds of pigs with an entry of 1,048; whilst 68 goats, 1,189 poultry, and 291 rabbits were also to be seen in the showyard.

The increase in the implement section must not be lost sight of; it had grown to such an extent that it was impossible to tabulate the number of implements and machines in the stands. When he mentioned that there were 453 stands under nearly 12,000 feet of covered shedding, those present would realize to some extent the increase in the activities of the Society in this direction. This did not include the stands in "open ground" space.

In accordance with the established custom, the Northumberland and Durham County Agricultural Societies had abandoned their local shows for this year and had made contributions to the prize fund of the "Royal" Society. Their members had been granted badges of membership with free admission to the Show, and such members as were exhibiting stock had had the privilege of doing so at reduced fees.

By the courtesy of the Freeman of the City, the spacious Town Moor was again the venue of the Show, as it had been in earlier years, but the area enclosed had been increased from 105 acres in 1908 to 146 acres. This area was the largest ever covered by the Society for its Shows, and was in itself a record. The site had been well prepared, and the Society were indebted to the Local Committee and all who had assisted them in levelling, laying the gas and water mains, and generally preparing the site.

In the year 1908, the then Prince of Wales, His Royal Highness's father, visited the Show, and it was a source of great satisfaction to all Governors and Members that His Royal Highness should be present that day. As would have been seen from the catalogue, H.M. the King and H.R.H. the Prince of Wales were again exhibitors of live stock at the Show.

It would, of course, be realized that but for the combined efforts of everyone connected with the organization of the Show it would be impossible to hope for success, and the thanks of the Society were due, and would at a later stage be formally tendered, to the Lord Mayor and Citizens of Newcastle, the Stewards of the Freeman, the Local Committee and its officials, and to all who had assisted the work in any way; but he was sure that all would agree that a special measure of thanks was due to the Honorary Director, Sir Gilbert Greenall, who, by his unique powers of organization and care for the smallest details, had carried out the administration of the Show and ensured its smooth and wonderful working. He would also like to mention their most able and hardworking Secretary, Mr. Turner, and his staff.

Brothers Colling Cup.

Mr. J. R. SPRAGGON, Chairman of the Durham Agricultural Committee, introduced Alderman Davis and Mr. William Parlour, who, on behalf of the county of Durham, presented to the Royal Agricultural Society "The Brothers Colling Shorthorn Memorial Challenge Cup." These gentlemen both addressed the meeting concerning the gift.

If they went back to the time when the Brothers Colling started breeding Shorthorns, Mr. PARLOUR said, it would be 140 years ago. Then there were no distinct breeds of cattle, and cattle-breeding was in a very backward condition. They had no standard to work to, every breeder had his own ideal, and changed it when he liked. That was the condition of affairs when the Brothers Colling came on the scene. The most popular animals of that day were big, coarse, slow-feeding cattle, which did not get fat until they were six or seven years old. The Brothers Colling started with a little bull, short on the leg, a mossy coat, and with an aptitude to fatten. This bull was the father of the Shorthorns, and his name was inscribed on the cup. After acquiring that bull, they got cows nearest to their ideals. The Collings were not only adept in breeding cattle, but also in advertising them. They let out their bulls, and they even let them to the reigning monarch of the time. A bull called "Windsor" was hired for three seasons running to King George III., and that was not the only bull they hired out to royalty. They also exhibited cattle, and there was the Durham Ox, which at six years of age travelled all over England and Scotland. Eventually an accident happened to this animal, in consequence of which he was killed at Oxford in 1807. Mr. Parlour also referred to what he said was the most famous animal of the nineteenth century— the bull "Comet," which even in those far-off days made a thousand guineas. The Brothers Colling made a great revolution in cattle-breeding; they were responsible for the coming of the quick-feeding animal as distinct from the slow-grower. The donors of the cup, Mr. Parlour added, felt that the Royal Agricultural Society was a proper Society to which to give it, and they hoped that those whose names would be inscribed upon it would be men who would be worthy by their skill, ability, and genius to follow in the footsteps of the Collings, the men to whose memory that cup was dedicated. (Applause.)

The President, on behalf of the Royal Agricultural Society, gratefully accepted the Challenge Cup.

Cockle Park Visit.

LORD BLEBISLOE moved a most cordial vote of thanks to the Committee of the Cockle Park Experimental Station, to the Armstrong College, and to Professor Gilchrist for the very rare treat they had given to members of the Council on the previous Monday by inviting them to visit the Experimental Farm, and for the opportunity afforded them to become acquainted with the magnificent pioneer work in agricultural research that was being carried on not only for the benefit of Northumberland farmers, but for the

grass farmers throughout the whole of Great Britain. His Lordship desired to acknowledge the kind and generous hospitality they had received on the occasion of their visit. The Cockle Park Station, he said, owed much to the sympathy and generosity of his colleague, the Duke of Portland, by whom it was let to the College at a nominal figure. The party were all immensely impressed with what they saw. They had inspected land which was once among the poorest pasture in the country, not worth more than five shillings an acre and hardly capable of feeding one sheep to the acre, which by the judicious application of basic slag had been converted into rich pasture worth thirty shillings, and capable of feeding a bullock per acre. To-day Cockle Park was pointing the way to the rest of England, and his Lordship could assure their hosts that members of Council would do whatever lay in their power to preach its profitable gospel all over the country.

Mr. J. L. LUDINGTON seconded the motion. As Chairman of the Royal Agricultural Society's Chemical Committee he felt that their thanks were due to those who had so kindly invited them to Cockle Park.

The resolution was unanimously passed.

Lord Mayor and Corporation Thanked.

Mr. C. ADEANE had great pleasure in proposing "That the best thanks of the Society are due, and are hereby tendered, to the Lord Mayor and Corporation of Newcastle-on-Tyne for their cordial reception of the Society." They as agriculturists, he said, needed the sympathy of the large urban populations, and he hoped that the great reception that Newcastle had given to the "Royal" was a good omen for the future. They all knew the enormous amount of work put upon the Lord Mayor and Corporation on an occasion like that, and the Society desired to thank them for all they had done, and also for their kind hospitality and courtesy. Before sitting down he would like to congratulate Alderman Gillespie, who had raised no less a sum than £10,000 as a local fund for the Society.

The Rev. C. H. BROCKLEBANK seconded the motion. Nothing he could say could add to the gratitude they all felt to the Lord Mayor and Corporation.

The vote of thanks having been heartily accorded.

The LORD MAYOR, on behalf of the Citizens of Newcastle, expressed their appreciation of the resolution that had just been passed. The City Council, he said, had from the first fallen in with the suggestion that the Society should be invited to hold the Show there in 1923, and when anything was taken in hand by that body it was well done. Whole-hearted support had also been received from the counties of Northumberland and Durham. The City Council were very much in touch with the Freemen through their Chairman, Mr. Walker, and this body by joining forces with the City Council had done everything in their power to make the Show a great success.

Alderman GILLESPIE (Joint Local Honorary Treasurer) said that in 1908 the Royal Agricultural Society's Council asked the Local Committee to raise £7,500 as a Local Fund. They did it. In 1923 the Council stated their requirements at £10,000, and they had got that sum. The proposer of the resolution had stated that "Alderman Gillespie had got it." He had helped, said the Alderman, but he had received most loyal support from Newcastle and Tyne-side, and also from the District Committees in Northumberland and Durham. He could only say that he was proud of the achievement in raising that £10,000; and if the Society were good enough to come to Newcastle for the sixth time he hoped it would not be fifteen years before the next visit. He knew sufficient of Tyne-side character to be able to say that, whatever the Society's requirements, they would be met.

Thanks to Local Committee.

Sir GILBERT GREENALL proposed, "That the best thanks of the Society are due, and are hereby tendered, to the Newcastle Local Committee for their exertions to promote the success of the Show." It was, he thought, very fitting that this resolution should have been entrusted to him, for he was brought more in touch with the Local Committee than any other member of the Council. He could assure those present that he had from the first been most loyally backed up by the Newcastle Local Committee. On the occasion of the Society's last visit he had made many good friends, and they had stood him in very good stead when it was decided to come back there in 1923. To the Chairman of the Local Committee, the Duke of Northumberland—whose father had done such excellent work for the 1908 Show—and to every member of that Committee, the thanks of the Society were due for all the assistance they had given. He personally thanked them from the bottom of his heart.

The vote of thanks was seconded by Mr. CRUTCHLEY, and passed unanimously.

Thanks to Railways.

LORD MILDNAY OF FLETE said it fell to him to move that the best thanks of the Society be tendered to the Railway Companies for the facilities afforded by them in connection with the Show. There was one thing of which those present could be perfectly certain, and that was that without the efficient co-operation of the Railways the Show could not be a success. As an exhibitor himself who had brought cattle from Devonshire, he had reason to be thankful to the Railways. The Companies, by the arrangements they had made and the facilities they had afforded, had given great cause for gratitude to everyone who attended the Show. He had great pleasure in moving the resolution.

Mr. G. P. MILN, in seconding, said he was sure that all exhibitors were grateful to the Railway Companies for what they had done to make the Show a success.

Members' Suggestions.

The resolution having been agreed to,

The PRESIDENT asked if any Governor or Member had any remark to make or suggestion to offer for the consideration of the Council.

Mr. ALFRED AMOS, Wye, said he presumed to offer two suggestions. The first was that the Society should revive the Farm Prizes Competition not only in the district of the Show, but in all parts of the country. This, in his opinion, would do an enormous amount of good. Regarding his second suggestion, that the Society should do more for the implement makers, he said that a lot was done for the pedigree stock breeders, and quoted the following figures from the accounts of the Cambridge Show:—The entry fees for live stock amounted to £10,500, and the fees for implements to £12,700. The shedding for stock cost £10,000; the prize money awarded was £11,500; the cost of forage was £2,000, and judges' fees amounted to £700, making a total of £24,200 as the cost of the live stock display. Against that, the cost of the implement shedding was £3,000, and the judges' fees were £30, making £3,030. These figures, he thought, showed that the Society was not doing enough for the implement manufacturers.

The PRESIDENT promised that the suggestions made would receive the consideration of the Council.

Thanks to President.

The EARL OF DURHAM said he supposed it was fitting that one from the North Country and a local man should propose a vote of thanks to Colonel

Stanyforth. On behalf of the counties of Northumberland and Durham he could say most heartily that they were glad to have seen such a successful Show. They had heard a good deal that morning about the Durham Ox, and His Royal Highness had said that man and beast had done their best. He sincerely hoped that His Royal Highness did not look upon him as "a beastly man." (Laughter.)

His Lordship went on to say that they had a "foreigner" there from Scotland in the Duke of Richmond, who had talked to them of the wonderful Border industries. Not so many hundreds of years ago—if his memory served him right—the chief industry on the other side of the Border was the raiding of their cattle on this side. (Laughter.) Now, in modern times, they had the Duke of Northumberland entertaining a Scotsman at Alnwick Castle. (Laughter.) He could understand the Duke and others looking with envy at the fine collection of stock in that showyard, and he suggested that if they started raiding nothing better could they carry off than Sir Gilbert Greenall's magnificent cob, on which he rode about the showyard. (Laughter.) He had the greatest pleasure in proposing a vote of thanks to Colonel Stanyforth for his services in the chair.

Mr. WILLIAM BURKITT seconded the motion, and congratulated Col. Stanyforth on the success of his efforts during his year of office.

The resolution having been unanimously passed,

The PRESIDENT expressed his gratitude for the way in which the meeting had received the resolution. When he had been elected, he had said that there was no higher honour that could be conferred upon any country gentleman than to be made President of that great Society. After working on the Council for over thirty years, it was a distinction not expected but thoroughly appreciated. In concluding, Col. Stanyforth expressed the hope that the rain, which had begun during the meeting, would not long continue, but that they would soon be favoured again with Royal weather, and that that Show would be the success they all trusted it would be. (Applause.)

WEDNESDAY, AUGUST 1, 1923.

LT.-COL. E. W. STANYFORTH (President) in the Chair.

The PRESIDENT said the Council would like to know that the Honorary Director had received an extremely nice letter from H.R.H. the Prince of Wales saying how much he had enjoyed the Show at Newcastle, and how grateful he was for the excellent arrangements made there for his comfort and convenience, and how admirably he thought the Show had been conducted. This praise for Sir Gilbert Greenall's excellent work was, they would all agree, extremely well merited. His Royal Highness wished to thank all the officials, the Stewards, the Secretary and the staff for all they had done to render his visit extremely interesting to him.

Two new Governors and 229 new Members were admitted into the Society.

The report of the FINANCE Committee was received and adopted. In presenting this report, Mr. ADEANE said the fact that they were that day able to invest £15,000 was some indication of the surplus they had made at the Newcastle Show. It certainly would not be less than £15,000, and would more likely be in the region of £18,000. They would also notice that they were increasing the contribution of the Society to the prize fund from £7,000 to £10,000, but that was not to be taken to mean they were increasing their prize list in any way. It was really an extra contribution of this Society to meet the breed societies and to relieve them

of a considerable part of the burden they had borne for a number of years, and was a practical acknowledgment of the great support they had given to the Society in troublous times. It was equally pleasing for the Council to be able to inform the exhibitors of implements and machinery that it was intended to make a reduction in their fees.

The PRESIDENT said the Council would remember that some months ago their Solicitor had attended and explained to them the Society's liability with regard to the rates at Park Royal. The resolution he now proposed referred to the sealing of agreements which had been entered into under which all the parties concerned would pay their own rates in future, though the Society was primarily responsible. The terms of the resolution were as follows :—

"That the seal of the Society be affixed to the following documents relating to the Park Royal Estate now presented to the Council, namely:—

- (1) An agreement in triplicate between the Society of the first part, the Great Western Railway Company of the second part, and Arthur Lambert Oswald William Griffith Roberts and Francis Henry Lambert, trustees of the will of Francis Devereux Lambert, deceased, and the said William Griffith Roberts and Colin Donald Melver, trustees of the will of Richard John Lambert, deceased, of the third part, supplemental to the agreement, dated the 30th June, 1903, between the Acton Urban District Council, of the county of Middlesex, of the first part, the Willesden Urban District Council, of the said county, of the second part, the Society of the third part, the Great Western Railway Company of the fourth part, and the said Francis Devereux Lambert and Richard John Lambert of the fifth part, whereby it is provided that the difference between the amount of the Willesden sewer rate and the payments made by the Willesden Council to the Acton Council, mentioned in the proviso to clause 9 of the agreement of 1903, shall as from 1st April, 1921, and as between the parties liable to the Willesden Council therefor be apportioned on the basis of the assessable values for the time being of the lands affected.
- (2) A deed of agreement and charge, dated 7th May, 1923, and made between the Society of the first part, the Great Western Railway Company of the second part, Francis Devereux Lambert and Richard John Lambert of the third part, and the persons whose names, addresses and descriptions are set out in the first column of the schedule thereto of the fourth part, whereby the present owners of portions of the land affected by the agreement of 1903 agree to the basis of apportionment as set out in agreement No. 1 above, and charge the lands owned by them with the payment of the proportions attributable thereto.
- (3) An agreement, dated the 7th May, 1923, between the Society of the first part, the Great Western Railway Company of the second part, Francis Devereux Lambert and Richard John Lambert of the third part, and the persons whose names, addresses and descriptions are set out in the first column of the schedule thereto of the fourth part, whereby the present owners of other portions of the land affected by the agreement of 1903 agree to the basis of apportionment as set out in agreement No. 1 above, but do not charge the lands owned by them with the payment of the proportions attributable thereto."

This resolution was adopted.

On the motion of Mr. ADEANE, it was resolved :—

"That in order to facilitate the winding up of the accounts for the Newcastle Show as early as possible, authority be given for the issue during the recess of orders on the Society's bankers for the payment of accounts connected with the Show."

LORD MILDMAY OF FLETE made reference to the recent discoveries of Prof. Dreyer regarding tuberculosis. A vaccine, effective against tubercle had, he said, been produced, and the application of this discovery to eighty cases of tuberculosis of all sorts at the London hospitals had met with most startling and splendid results. Work was also proceeding at the Medical Research Council's farm at Hampstead in the direction of immunising calves. If this succeeded, the whole tuberculosis problem of dairy milk would be solved.

LORD BLEDISLOE called attention to the fact that at the meetings of the Agricultural Advisory Committee and the first meeting of the Advisory Committee on the Imperial Economic Conference, the Minister of Agriculture had stated that he had given his assent to the proposal that there should be a reciprocal interchange of breeding stock between this country and the Overseas Dominions, because the breed societies had agreed to

such a course, and the R.A.S.E. Council had endorsed the proposal with their approval. The House of Commons Agricultural Committee had been similarly influenced by the alleged attitude of the breed societies and the Council of the Royal Agricultural Society, and they were prepared also, if not to approve, at least to accept as inevitable, the decision of the Minister. His Lordship asked whether the matter had ever been brought before the Council, and whether it was a fact that they had unanimously approved the course that the Minister proposed to take.

The Rev. C. H. BROCKLEBANK stated that this question had been raised at the Council meeting of the Shorthorn Society on the previous day, but so far from endorsing the proposed action, there had been strenuous opposition.

Lord MILDMAY, on behalf of the South Devon Society; Mr. A. P. TURNER, on behalf of the Hereford Herd Book Society; and Mr. TINDALL, on behalf of the Lincolnshire Red Shorthorn Association, all repudiated any agreement in the direction suggested.

The SECRETARY, in reply to Mr. ADEANE, said that no resolution of that nature had ever been approved by the Council.

On the motion of Lord BLEDISLOE, seconded by Lord AILWYN, it was resolved:—

"That this Council is strongly opposed to the suggested importation of breeding stock from other parts of the British Empire."

Lord NORTHBROOK raised another very important matter of principle. He understood that the Minister of Agriculture had stated the other day that they were obliged to admit stock from Canada because of a promise that had been given to that effect, which to his mind was a very unsatisfactory state of affairs. It seemed that when the Minister was asked what had taken place they were told that a pledge had been given, that an Englishman's word was his bond, and nothing more was to be said about it. He could not see what right a Minister had to give such a pledge—by which they were to consider themselves bound—without consulting Parliament or the agricultural opinion of the country. He thought they should make a very strong protest against action of that sort. Apparently they were not supposed to have anything to say in the matter, and were not given any opportunity of expressing their views. His lordship then asked the Council to pass the following resolution:—

"That the Council of the Royal Agricultural Society of England strongly protests against any renewal of the practice of giving pledges at the Imperial Conference to the detriment of British agriculture without either the knowledge or consent of Parliament or of British agriculturists."

Mr. ADEANE seconded the resolution, which was carried unanimously. Copies were ordered to be sent to the Prime Minister, the Minister of Agriculture, and the Chairman of the Agricultural Committee in the House of Commons.

The Hon. CECIL T. PARKER, in moving the adoption of the Report of the Committee of SELECTION, gave a record of the services of Mr. Ernest Mathews in connexion with the Society. From this record, he said, all members of Council would agree that Mr. Mathews was in every way worthy, and he (Mr. Parker) had the greatest pleasure in proposing that he be nominated as President for 1924.

Col. STANFORTH supported the suggestion. He considered that Mr. Mathews' services rendered him most suitable for the position, as there was no one more respected—he might say beloved—by the Council than Mr. Mathews.

The proposition having been unanimously agreed to, Mr. MATHEWS said it was extremely difficult to express his thanks nicely for the great honour that had been done him. When it was first mentioned to him he hesitated before he could allow his name to be put forward, because although he had done a certain amount of work for the Society, one could

not help doing this, particularly when one had the honour of being Steward under Sir Gilbert Greenall. No Steward could help working with such a fine example as Sir Gilbert, who was always ready and anxious to do everything he could for them. There was another reason for his hesitation; he did not know whether he was strong enough to succeed those former Presidents of the Society who had done so much. But he would do his very best, and he knew that he would have the support of all the members of the Council and of the staff.

WEDNESDAY, NOVEMBER 7, 1923.

Lt.-Col. E. W. STANYFORTH (President) in the Chair.

Before opening the ordinary business, the PRESIDENT said it was with great regret that he had to refer to the death of Mr. J. T. C. Eadie, who had been a member of the Council since 1905 as representing the division of Derbyshire. As most of those present knew, Mr. Eadie had been a well-known breeder of Shire horses and had rendered most useful services to the Society in connexion with the visits of the Show to Derby in the years 1906 and 1921. Mr. Eadie was with them as recently as the last Council meeting on August 1, and as his death had occurred during the recess, this was the first opportunity he had had of referring to it.

The members of the Council present expressed their sympathy and regret by rising in their places.

Five new Governors and 32 new Members were admitted into the Society.

In presenting the Report of the FINANCE Committee, Mr. ADFARE stated with regard to the collection of rates on the Park Royal Estate that money was beginning to come in. The Society had paid out to the Willesden Urban Council something like £1,000 and had received about £400. Their solicitor had informed him that the ratepayers had agreed to the assessment and to pay the rates in future as occupiers. The Finance Committee were very glad to be able to recommend that the grant to the Royal Veterinary College should now, in view of the better state of the Society's finances, be restored to the old figure of £400. The privileges to the Leicester Agricultural Society were the same as those which had been granted hitherto under similar circumstances. Members of the local agricultural society would have the same Show privileges as members of the Royal Agricultural Society. In accordance with the understanding arrived at by the Council when they last met with regard to a reduction of fees for implements, this had been passed in detail by the Finance Committee, and the cost to the Society, as compared with the receipts at Newcastle, would be about £2,000. With regard to the question of salaries and gratuities, this matter had been referred to a small Subcommittee, who had gone into the matter and reported yesterday. The Committee felt that the responsibilities of the Secretary had much increased, and also his work, and that altogether the remuneration he received was inadequate. Therefore they recommended that his salary be increased by £250 a year. The Finance Committee also felt that the immense amount of work done by the staff in connexion with the Newcastle Show, which had had such a magnificent result, ought to be acknowledged, and they therefore recommended that the sum of £255 be distributed amongst them.

The Report was received and adopted.

Mr. COLTMAN-ROGERS said it might interest Members of Council to know that 1924 would be the fourteenth occasion on which the Society

had held a Plantations Competition. These competitions were inaugurated in 1909, and had been continued annually, except during the two years when the Show was not held. In all but two of the fifty-two counties they had afforded to the proprietors of woodlands the opportunity of submitting their plantations for competition. He hoped that before very long they might be able to include Hampshire and Dorset, and so complete the whole round of the country.

In presenting a Report from the ORCHARDS COMPETITION Committee, which was received and adopted, Colonel WHEELER said that, at the meeting on the previous day, there had been present representatives of all the four counties included in the area, and he hoped there would be a good competition in consequence. The classes would practically follow those of last year, but had been modified slightly to meet the conditions of the new area.

The Report of the VETERINARY Committee was presented and adopted, after some discussion regarding Foot-and-Mouth Disease and Swine Fever, in which discussion the following took part:—Sir DAUGLAS NEWTON, Sir JOHN McFADYEAN, Lord BLEDSLOE, Mr. DAVID DAVIES, Mr. JAMES FALCONER, Mr. G. G. REA, Mr. DAVIS BROWN. Eventually the President said he was sure that the remarks of the various speakers as regards Swine Fever and Foot-and-Mouth Disease would be carefully considered by the Veterinary Committee, who, he had no doubt, held views similar to those which had been expressed.

The Report of the STOCK PRIZES Committee having been presented, Mr. FALCONER referred to the paragraph on the question of giving awards to agricultural workers for long service, and said he had had a letter from the Secretary of the Highland Society, which body had done this sort of thing for several years, and it was one of the most popular things done by that Society, and had done a great deal to promote good feeling between employers and employed. There was never a time—Mr. Falconer continued—when good fellowship and good feeling between employers and their labourers was more needed. He was quite willing to draw up a scheme for the offer of these awards, but he would like to have the assistance of two or three other members of the Council.

Mr. DAVIS BROWN said that, as he was mainly instrumental in securing that this question should be referred back to the Committee of Selection instead of being turned down, perhaps he might be allowed to say a few words. He did think that the time had come, and was perhaps somewhat overdue, when the Royal Agricultural Society should do something for the agricultural labourer.

Another matter was with regard to reducing the number of entries to secure two judges for sheep classes. He chanced to be President of the National Sheep Breeders' Association, and could therefore speak for pedigree sheep breeders throughout the country. It was a matter upon which they felt very strongly that the number of entries, 60, was too high to secure two judges, and particularly as the number was based on a five years' average. That average, he thought, was too long, and ought not to be more than three years. With a five years' average they might have one judge to award the prizes for 70 or 80 exhibits. That number was too many for one man. He would press on the Judges Selection Committee that that matter should receive further consideration.

Mr. ADEANE said he hoped the valuable suggestions made by Mr. Falconer would be carried out. The Society did formerly have competitions for agricultural labourers, and he thought in these days it was most desirable to encourage the good man to stay on his farm and do his best for his employer.

Mr. GUY FENWICK supported Mr. Falconer's proposal as it was most important, he said, that the Society should do something for labourers who stood by their employers when others went back on them.

Sir MERRIK BURRELL said he was perfectly sure that the offer of long service medals was a matter that would take an enormous amount of organizing and would be very costly. He thought money would be better spent by encouraging the young men to learn the technical work of the farm.

Mr. F. H. THORNTON suggested that the Council might consider the question of holding a dry-handed milking competition. One was held at the Dairy Show, and it would be a valuable thing if the "Royal" could undertake such a competition.

Mr. R. G. PATTERSON said he had been prepared to speak at length upon the question, but in view of the sympathetic reception it had had from the Council he need only express the hope that something would soon be done by way of recognition of the agricultural labourer. They must have regard to the fact that while his wages had been reduced he had stuck loyally to the farm, and it would sweeten his lot if he felt that the Royal Agricultural Society were recognizing him.

The PRESIDENT said that the Society had in the past had a scheme of this sort, but it was not altogether satisfactory, and it had been deemed very much better that it should be left to local societies.

The Report of the Committee of SELECTION was presented, including a recommendation regarding the dates of Council meetings in 1924. To this report an amendment, proposed by Mr. MIDDLETON, seconded by Mr. REA, was carried to the effect that the meetings proposed to be held on January 30th and February 27th be put forward a week.

[Dates for Council Meetings next year will therefore be February 6th, March 6th, April 2nd, May 7th, June 4th, July 2nd, July 30th, November 5th and December 10th.]

Sir DOUGLAS NEWTON raised two other questions on the report of the Committee of Selection. One was in connection with a letter from the Ministry of Agriculture regarding meetings of a social nature with agriculturists from overseas who were expected to attend the British Empire Exhibition. The report stated that "it would not be necessary for the Council to appoint a representative to confer with members of the National Farmers' Union and other bodies." He did not himself quite like seeing the premier Society banging and barring the door against taking any part in the British Empire Exhibition. At any rate, he thought, they might accept the suggestion that the Society should appoint a representative to confer with other bodies. No harm could come of it, and it might do some good. The other point was the minute which referred to the National Milk Publicity Council. This, again, was a matter connected with the British Empire Exhibition. The report stated that "The Committee are unable to recommend that any contribution be made." He asked that this matter might be allowed to stand over. The National Milk Publicity Council was composed of representatives of the National Farmers' Union, the Agricultural Organization Society and other bodies, and if a few hundred pounds from the resources of the Royal Agricultural Society could assist in developing the milk industry it could not, in his opinion, do anything better for agriculture as a whole. No reason had been put before the Council in the Minute Book, which he had carefully read, and he did feel that it might be desirable to let this matter stand over for further consideration.

Replying to Sir Douglas Newton, the Hon. CECIL PARKER said that the first matter was with regard to meetings of a purely social character, and that it was not considered necessary for the Society to join with other bodies in entertaining agriculturists from overseas. If anything was done in this way it could most fittingly take place at the Show. He also explained the reasons which guided the Committee in arriving at their decision that they were unable to comply with the request of the National Milk Publicity Council.

Mr. PATTERSON quite realized the advantages of the Society entertaining visitors at the Royal Show. He thought, however, it might look strange if the Society had nothing to say in connexion with the great exhibition. There might be good reasons for the Committee's decision, but he did think that the effect might be a little unfortunate.

Regarding a resolution standing in his name on the Agenda, Lord BLEDISLOE said he did not now propose to move it, partly in the interests of complete harmony between them during a period of serious agricultural crisis and partly because, since his motion had been put down, the Government had come to a definite decision which nothing the Council could say was likely to alter, and which now awaited Parliamentary sanction or rejection, as the case might be. On the general question of the importation of breeding stock from abroad, he concluded that the decision recorded in their Minutes represented, and would continue to represent, the views of that Society.

The Report of the Council to the Annual General Meeting of Governors and Members, to be held at the Royal Agricultural Hall, Islington, at 2.30 p.m., on Wednesday, December 12th, was prepared and ordered to be issued.

WEDNESDAY, DECEMBER 12, 1923.

LT.-COL. E. W. STANYFORTH (President) in the Chair.

Two new Governors and 33 new Members were elected.

The Report of the Finance Committee was received and adopted. In presenting this report, together with accounts for the Newcastle Show, Mr. ADRIANE said Colonel Stanyforth was very much to be congratulated on having presided over one of the most successful Shows ever held. It was their custom in dealing with the Show accounts to compare them with the previous year. If they compared Newcastle with Cambridge, it would be found that the receipts exceeded the Cambridge figures by £16,803. This increase was almost entirely due to the "gate." The expenditure showed a decrease of £2,241, and this money had been saved on the cost of erection of the showyard. The total receipts amounted to £72,479, against an expenditure of £53,378, giving a credit balance of £19,101. This constituted a record, and was not likely to recur. What they must hope for now was stability. As the Council were aware, a considerable reduction in charges for implement fees now proposed would cost the Society, on the Newcastle figures, the sum of £2,200; and an addition of £3,000 to the Prize Fund would save the Breed Societies an equivalent amount. That was as far as it was considered prudent to go at present. During the last few years a sum of £1,500 had been charged to the Show account for the renewal of timber but as the price of timber had now fallen it was proposed to reduce this sum in future to £500. They were indebted to many people for the great success of the Show. First of all to the Lord Mayor of Newcastle, to whom they desired to express their thanks for all his hospitality to the Society. They would like also to thank the Local Committee for the great efforts made on the Society's behalf, for the splendid arrangements and for the great fund they had raised, amounting to over £10,000. He thought they ought also to recognise the enormous amount of work done by their honorary Stewards. They did not all belong to the Council, but they gave their services ungrudgingly, and it was largely due to their efforts that the Newcastle Show was the great success it had been. And, as ever, they were grateful to Sir Gilbert Greenall, their Honorary Director, for all the work that he had done.

The PRESIDENT said the Council had heard the very satisfactory result

of the Newcastle Show. Mr. Gillespie, the Treasurer of the Local Fund, was present and would address the Council.

Mr. Alderman GILLESPIE (Newcastle-on-Tyne) heartily congratulated the Council and its Finance Committee on the report presented that morning. It would, he knew, give intense satisfaction to the citizens of Newcastle and residents in Northumberland and Durham. In 1908 the Show resulted in a surplus of £10,000, and this year, as the Chairman of the Finance Committee had told them, the surplus was £19,000, altogether £29,000. That was a good record and one of which they in the North were naturally proud. The Local Fund which had been raised reached the sum of £10,000. They had discharged all liabilities, except that they had reserved £260, the balance needed for the restoration of the site in the spring of next year. Moreover, it had not been necessary to make any call on the Newcastle guarantee of £2,500. In a word, he wished to thank the President, the Council, Sir Gilbert Greenall, Mr. Turner and all officials of the Society for the courtesy and kindness they had shown to the Newcastle Committee at all times. Might he say that they wished the Leicester Show a very great success, and if their surplus exceeded that of Newcastle he would not begrudge it one bit. (Laughter.)

The Earl of NORTHBROOK, in presenting the Report of the Veterinary Committee, read to the Council the following letter, handed to him that morning, which Mr. Adeane had received from Mr. Vincent Yorke, on the accuracy of whose statements the Council could place the greatest reliance :

DEAR ADEANE,—

FORTHAMPTON COURT, TENNESSEE,
December 10th, 1923.

FOOT-AND-MOUTH DISEASE.

As five farms of mine at Forthampton have now been visited by the above, I have had some opportunity of observing the official method of dealing with it. This appears to me to be thorough and vigorous in all respects except one—namely, the time that is allowed to elapse between the notification of the disease and slaughter of the affected animals.

From my observation from twenty-four hours to forty-eight hours is allowed to be taken up with veterinary examination and valuation, during which time the affected animal or animals remain in the fields, and are a focus of infection to the whole neighbourhood. I quite recognise the necessity for expert diagnosis and for valuation, but as only one or two of the animals as a rule show evidence of the disease at first, the valuation of the 4 ought not to be difficult, and the moment that this has been arranged they ought, in my opinion, to be knocked on the head and buried in quicklime.

The only other criticism I have to offer is that in one of these cases a large number of cattle and sheep were driven quite half a mile from the fields in which they caught the disease up to the farm to be slaughtered, thus infecting a considerable area of country which otherwise would not have had any diseased animals on it. The reason given for this was no stockade on the spot in which to slaughter.

Yours ever,

(Signed) VINCENT W. YORKE.

The Council would agree, Lord NORTHBROOK thought, with Mr. Yorke that there had been unnecessary delay in the slaughter of infected animals on his farm and consequently danger of spreading the disease in the neighbourhood. It seemed to him very undesirable, to say the least of it, that infected cattle and sheep should be driven half a mile along a highway to be slaughtered. He asked the Council to agree to send to the Minister of Agriculture a copy of this letter calling attention to the statements of Mr. Yorke.

Lt.-Col. G. L. COURTNEY said that while this report was before the Council he wished to draw attention to the fact that at to-morrow's meeting of the Council of Agriculture would be put forward a resolution the end of which was to the effect "that the policy of slaughtering infected animals be discontinued and therefore no further compensation be paid." The Royal Agricultural Society's Council would probably agree with unanimity that, until the veterinary authorities reported that the disease was out of control and had become endemic and that the policy of slaughter was no longer justified, they should support the Ministry in maintaining the present policy of slaughter. He could not help feeling that a strong expression of opinion by that Council and by the members at the general meeting that afternoon, if carried, might have great influence with the Council of Agri-

culture and also with the Committee of the Cabinet set up to consider the serious position that had arisen with regard to foot-and-mouth disease. If the Council shared his views he would ask that their opinion should be strongly expressed, and that the utmost publicity should be given to the matter.

Mr. CHRISTOPHER MIDDLETON supported what had been said by Col. Courthope. They all recognised that an outbreak of foot-and-mouth disease might assume such dimensions that it would no longer be practicable to deal with it by the present methods. The Council were, however, not prepared to admit that such a position had yet been reached and there ought to be a most careful inquiry. The Society ought to act and their views ought to be placed before the Committee of the Cabinet and the Council of Agriculture before they came to a decision.

Mr. BROCKLEHURST, referring to the letter read by Lord Northbrook, said there was another very important point which had come up before the Gloucestershire Diseases of Animals Committee. That was the delay which had arisen between the occurrence of suspected cases and the making of an Order restricting movements. There was no doubt about it that whatever was done in such cases should be done as promptly as possible. In many cases there had been delay in getting out the Order, and in some of them it was known that dealers had moved cattle after hearing of a suspected outbreak and before the Order had been made; and there had been no means of stopping them. What they suggested to meet the case was that the chief constable, on the opinion of the veterinary surgeon of the district, should at once make a "stand-still" Order, under which no cattle should be moved within fifteen miles of a suspected case. Unfortunately in Gloucestershire they had had many cases—fifteen, he thought, within the last fortnight—and they felt that the great delay, in allowing cattle to be moved after the report of a suspected case, might be avoided if the Order were made more promptly.

Mr. ALFRED MANSELL, as a member of the recent Departmental Committee on Foot-and-Mouth Disease, said he felt convinced of the wisdom of the policy of slaughtering. He did not know if the Council were aware of the letter written by Messrs. P. and G. Hughes, in which they said that although foot-and-mouth disease was curable, yet in the majority of cases cattle could not be successfully reared afterwards, and there was a large consequential loss. Regarding the point raised by Mr. Brocklehurst, this had been considered by the Departmental Committee, who had recommended that on the report by a veterinary surgeon of a suspected case of foot-and-mouth disease an automatic "stand-still" Order covering a five-mile radius should at once come into effect. As a matter of fact, he had himself drawn Sir Stewart Stockman's attention to the fact that in a great many districts this did not operate owing to a misunderstanding on the part of the police. On the confirmation of a suspected outbreak the five-mile radius was increased to a radius of fifteen miles. He was of opinion that in cases where one or two animals were found to be infected they should be slaughtered straight away and the sound animals which had been in contact could be slaughtered later on. He hoped the Council would recommend the continuance of slaughtering as against isolation. They had had a great number of witnesses before the Departmental Committee, but every man from North, South, East and West had agreed that slaughter was the best policy. He understood that foot-and-mouth disease in France cost that country about five millions per annum, and this could quite well be realised by anyone, like himself, who had travelled much on the Continent looking for stock. He had been told on many occasions that he could not go to farms on account of foot-and-mouth disease. It would be a most serious matter if the disease once got out of hand and became general in this country.

Sir MERRIE BURRELL endorsed what Mr. Mansell had said. He had

heard of complaints on the same lines as those referred to by Mr. Brocklehurst, to the effect that local authorities did not take immediate action on the occurrence of a suspected outbreak. He would like to point out, however, that this was not the fault of the Ministry of Agriculture, but was entirely the fault of the local authorities concerned. If a farmer suspected that an animal of his was suffering from foot-and-mouth disease he was responsible for reporting the case immediately to the police, and the police at once stopped all movement of animals within a five-mile radius of the suspected outbreak. It was their duty to do so, and had nothing to do with the Ministry. He would like to emphasise this point, because he knew that there was a good deal of misunderstanding regarding it. It was most important that that first step should be taken without delay. When a suspected case was confirmed, the area was extended to a fifteen-mile radius; but the first step could be taken, and should be taken, by the local people.

Mr. BROCKLEHURST explained that he was not alluding to the Ministry. The misapprehension was in the arrangements between the chief constable and the local authorities for carrying out a stand-still order.

Mr. PATTERSON said it had often been his misfortune to be in a minority, and he would probably be in a minority of one that day. He was not satisfied that the policy of slaughter was achieving the result they hoped it would achieve. There was no doubt that in the early stages of an outbreak slaughter was the best method of dealing with it, but what was going to happen if the present wholesale slaughter continued much longer? He knew of three parishes in Cheshire in which at the present moment there was not a beast, pig or sheep left, and the consequences, to his mind, were going to be extremely serious. He was inclined to think that there was the possibility that the time would come when the Ministry would be compelled to consider whether they could continue, at the enormous cost, the policy of slaughter. They had heard that a Cabinet Committee had been formed to consider the question, and he deprecated the passing of any resolution that might prejudice the view that Committee might take.

The PRESIDENT said there were two things before the meeting, which he thought should be dealt with separately. The first was Lord Northbrook's suggestion that the letter from Mr. Yorke be sent to the Ministry of Agriculture. Was it the pleasure of the Council that that be done?

This was agreed to.

The PRESIDENT said they next came to Col. Courthope's resolution, which had been seconded by Mr. Middleton:—

That this Council reasserts its conviction that the present policy of slaughter with compensation in cases of foot-and-mouth disease must be maintained, and offers strenuous opposition to all efforts to secure the discontinuation of this policy, unless the veterinary authorities definitely recommend such action.

This resolution having been passed, the report of the Veterinary Committee was also adopted.

On the presentation of the Report of the Committee of Selection Sir DOUGLAS NEWTON, referring to a suggestion he had made that a string should be attached to the show catalogue to facilitate carrying, said he did not know how far the Committee had investigated the matter, but the idea had occurred to him as the result of the practice now in operation in connection with the Motor Show. There they had a catalogue which was equally bulky and equally inconvenient to carry about; they had now fitted it with a string. He did not know if the Committee had had before them the specimen copy he had forwarded to the Secretary.

The Hon. CECIL PARKER said this specimen had been submitted; it had a canvas back, and was very much smaller than their own show catalogue.

Sir DOUGLAS NEWTON asked if any printer had been approached regarding this suggestion, as he thought that the difficulties mentioned by the Committee could be got over.

Mr. FALCONER said he did not quite catch the reference in the Committee's report to long service medals. Was it proposed to refer this matter to Local Societies?

The PRESIDENT explained that this matter had been considered by the Selection Committee on the previous day, and they had come to the conclusion that they were too large a body to deal with the details, and had appointed a Sub-Committee, of which Mr. Falconer had been nominated as a member, to go thoroughly into the whole matter. The Committee had had Mr. Falconer's letter before them and all the information he had given.

Sir DOUGLAS NEWTON suggested that the Committee should obtain expert opinion as to the practicability and expense of adopting his suggestion in connection with the catalogue, for he was convinced that it would be a great advantage. Might he ask that the matter be referred back to obtain information from the firm that printed the catalogue?

The PRESIDENT said the feeling of the Committee was that there was not much advantage in having a string.

With regard to the report of the Committee of Selection, the PRESIDENT said the Council would have heard read out the names of the new members appointed to serve on the Council. He begged to extend a hearty welcome to those present for the first time that day, and trusted they would give the Society the benefit of their time and experience as often as was possible. He knew that some lived a long way off, but he hoped the Council might see them there as frequently as their arrangements would permit. The names of the new members present were: Mr. Adton, Mr. Burkitt, Mr. Dickie, Mr. Howkins, Mr. Straker, and Major Tomkinson.

The report of the Committee of Selection was then adopted.

Lord BLEDISLOE, in the absence of the Duke of Devonshire, submitted the report of the Research Committee for adoption, and, in doing so, called the attention of members of Council to the extremely valuable and instructive leaflet prepared by four of the greatest experts on the subject in the country on sowing down land to grass. It was, in his opinion, a most authoritative publication on the subject. Members of Council would, he knew, endorse the expression of thanks which the Committee had conveyed to those gentlemen.

The following resolution was moved by the PRESIDENT and seconded by the Hon. CECIL PARKER:—

That the Bye-laws at present numbered 24 to 56 inclusive, and the Resolutions of Council numbered 1 to 40 inclusive, appended to the printed copy of the Bye-laws passed on the 8th day of December, 1875, be and the same are hereby rescinded, and that the proposed new Bye-laws numbered 24-117 inclusive contained in the printed document submitted to this meeting be and the same are hereby enacted and be printed, together with the other Bye-laws and the Charters of the Society, and that the Bye-laws enacted under the provisions of the Supplemental Charter be re-numbered to follow consecutively after Bye-law 117.

Sir DOUGLAS NEWTON moved the following amendments to the resolution, namely:—

- (1) That in Bye-law 25 the words "or any 8 Members of the Council" be substituted for the words "1 Trustee, 2 Vice-Presidents, and 5 other Members of the Council."
- (2) That the following words be added to Bye-law 28, viz.: "Provided that the question so postponed shall be disposed of at the next monthly meeting and no further postponement thereof shall be permitted."
- (3) That in Bye-law 30, paragraph (4), the words "and adjourned" be added after the word "postponed."
- (4) That in Bye-law 81 the words "in his discretion" be omitted and the words "with the consent of a majority of the Members present and voting" be substituted therefor.
- (5) That in Bye-law 34 the words "if challenged" be inserted after the word "must."
- (6) That the word "five" be substituted for the word "ten" in the 7th line of the Bye-law 39.

On being put to the vote the amendments were carried *nem. con.*

Mr. DAVIS BROWN then moved the following further amendments, namely:—

- (1) That in Bye-law 28 the whole of the first sentence be omitted and the following be substituted therefor; namely:—

- The monthly meeting of the Council shall have the full power to originate, discuss and decide all questions brought before it on the business of the Society. Except where otherwise provided in these Bye-laws every such question shall be decided by a majority of those present and voting. The voting shall be by show of hands. The President or other Chairman may vote in the first instance, and in case of an equality of votes may have a second or casting vote. Where the Chairman has not voted in the first instance, he may, in the case of an equality of votes, give a casting vote.
- (2) That the word "recommend" be substituted for the word "appoint" in the second line of Bye-law No. 64.
- (3) That in the third line of Bye-law No. 16 the word "the" be substituted for "these."

These amendments were also adopted *nem. con.*

The original resolution, as thus amended, was then put and carried unanimously.

The following Standing Committees were appointed for 1924: Finance, Journal and Education, Chemical, Botanical and Zoological, Veterinary, General Show, Stock Prizes, Judges Selection, Implement, Showyard Works, Selection and General Purposes, Dairy and Produce, Horticultural, and Research. The present members of the various Standing Committees were (with some exceptions) reappointed to those Committees.

Proceedings at the Annual General Meeting of Governors and Members,

HELD AT THE ROYAL AGRICULTURAL HALL, ISLINGTON,

WEDNESDAY, DECEMBER 12, 1923.

LT.-COL. E. W. STANYFORD (PRESIDENT) IN THE CHAIR.

President's Opening Remarks.

THE PRESIDENT, at the commencement of the proceedings, said it was a year ago since the Governors and Members had done him the great honour of electing him President of the Royal Agricultural Society, and it was his duty that day to give some account of his stewardship. It was usual for the President to make a few opening remarks before the report of the Council and the accounts were submitted.

His first duty was to express the thanks of the Society to the Royal Agricultural Hall Company and the Smithfield Club for the loan of that room in which to hold their meeting. He was sure they would all agree with that. (Hear, hear.)

It would be seen from the report of the Council, which was in the hands of those present, that there was a loss in membership by death and other causes during the year under review of 218, and he would urge individual members of the Society to make good that loss. He knew that times were not good, but with a little personal effort on the part of each member he thought he might reasonably anticipate for his successor in the presidential chair a goodly number of proposals for the first meeting of the Council in the year 1924.

It had been his earnest endeavour to increase the membership, but it was not anything like what it ought to be for a Society like theirs, and he felt certain that individual members would realize that it did not entail a great deal of trouble or exertion for members to get one new subscriber a year. He had ventured to ask Governors and Members of Council to find ten new members each, and he was glad to say that in some instances that suggestion had been accepted with great willingness and their numbers had been increased. He did, however, appeal most earnestly to those present to do what they could to increase the membership, because the

membership roll was the safest banking account, as they could not always rely on the financial success of the Show. They could sometimes, but not always. The Secretary had sent out a form of application to all members, and he trusted that everybody in that room would secure some friend who would become a member of that great Society.

The Show at Newcastle-on-Tyne had been a wonderful one—in fact, it had been a record one—and would, he felt sure, always be an outstanding one in the history of the Society. Their thanks were due to the Lord Mayor and Corporation of Newcastle, to His Grace the Duke of Northumberland, to the Stewards of the Freemen of that City, and to all the local officials who did so much to assist and ensure the success of the Show in their preliminary and local arrangements. Nothing had been wanting in hard work, zeal, and attention on the part of everyone in Newcastle, and it was owing to their efforts that their Show had met with such great success. His own memories of the Show would ever stand out as a distinctly pleasant recollection of his association with the Royal Agricultural Society as its President for this year, and he thought all would agree that their North Country friends had done their best. (Applause.)

The weather on the occasion of the Show also had been in their favour, which had not always been the case, although he believed the Society had on the occasions of its visits to the Tyneside city in the past been especially honoured by the Clerk of the Weather.

The visit of H.R.H. the Prince of Wales to Tyneside and his attendance at the Show on the Wednesday and Friday, as well as his presence at the General Meeting, was as pleasing to Members of the Society as it was to the residents of Newcastle and district. That he occupied a unique position in the hearts of the people of industrial centres as well as agricultural and sporting districts, was fully proved, and the large attendance upon the two days mentioned must be ascribed in a great measure to the kindness and goodwill of His Royal Highness in attending the Show. The Society owed him no small debt of gratitude. (Applause.) He might tell them that His Royal Highness had been graciously pleased to inform the Council of the pleasure he had derived from his visit to Newcastle, and everything connected with it.

The accounts for the Show would show a balance of receipts over expenditure of £19,101 11s. 2d. This was a truly remarkable result, and one not likely to be attained in future years by any town or city having the honour of receiving the Society on the occasion of its country meeting. It was a record financial success, and would place the Society in a position to do a great deal more good in the future.

He, personally, would, and he knew the Council and Members would, like to congratulate Sir Gilbert Greenall, the Hon. Director, upon the excellent result. (Hear, hear.) Sir Gilbert laboured long and anxiously to attain this end, and he spared no time or money, and no one knew what a master of detail he was except those brought closely in contact with him, nor the great amount of work and energy he put into all he did for the Royal Agricultural Society. The success of the Show, therefore, must be—and he was sure was—particularly gratifying to Sir Gilbert, but they were also deeply grateful and indebted to the Secretary and his staff. He thought he could truthfully tell the Members of the Royal Agricultural Society that they were extremely fortunate in the Secretary they had at present. As an ordinary Member of the Council he had had the opportunity of seeing his work, but the President and Hon. Director had more insight into the secretarial work than an ordinary Member of Council, and he was gratified the other night to hear how Sir Gilbert Greenall had endorsed, not only what he was trying to say to them, but he had also said that it was the greatest pleasure to him to have a man he could work with. Mr. Turner was full of zeal and full of energy, and there had never been a question that he did not know the detail of at once.

He considered that the Society did well when they elected Mr. Turner to the post, and they were extremely lucky in having him as Secretary.

As most of them knew, the Show would be held in Leicester next year. A very good site, about a mile from the centre of the City, had been secured, and the civic authorities of Leicester had already spent considerable sums upon the levelling, draining, and laying out of the land, which preliminary work had provided employment for many of the ex-Service men of Leicester, who otherwise would have been unemployed. By a scheme of Town Planning, the Tramway system of Leicester was to be brought to the very door of the showyard, so that access from the city would be comparatively easy. It was some twenty-eight years since the "Royal" last visited Leicester, and he was sure that after that long interval every one would desire the success of the Show and work to that end. At any rate, he might say that the prospects at present were extremely hopeful. He had just left the Mayor of Leicester and other members of the Local Committee who attended their meetings in London, and he could assure those present, from what he had heard that day, that those gentlemen would leave no stone unturned to make the Show next year in the very centre of England an enormous success.

Although in connexion with the Leicester Show the Council had decided to give a further £3,000 towards the Prize Fund, making a grant of £10,000 in all, the Breed Societies had expressed their desire to assist by financial contributions in making the classification and prize-money attractive to exhibitors, and such monetary contributions as they offered were gladly accepted by the Society and helped materially towards the ultimate success of the Show. The Breed Societies came to the help of the "Royal" at a time when their finances were not in the sound position they were at present. They had acted in a most generous way, and the Council felt that when the finances of the Society were in a better position they ought to try to relieve those Societies to some extent of the large sum of money that they had always helped the "Royal" with in order to increase the Prize List. To them also the cordial thanks of the Society were tendered.

The Show, as members well knew, did not absorb all the interests of the Society. The Plantations and Estate Nurseries Competition and the Orchards and Fruit Plantations Competition had also been successful. The work of the Research Committee had also been progressive, and several new schemes had been put forward, supported, and in some cases financed, by that Committee, whilst the Departments of Chemistry, Zoology, Botany, and Veterinary Science had in addition contributed their quota. The year had been an exceptionally busy one, and it had fallen to his lot to undertake during his year of office the revision of the Bye-Laws of the Society for the regulation of the procedure at future meetings of the Council. The new Bye-Laws had been passed by the Council that morning, and, he hoped, would aid their deliberations.

His Presidential year had been a happy one. He had received every help from the Council, and he trusted that the hope expressed by him when elected in that room last year, that he should endeavour to fulfil satisfactorily the duties placed upon him had been realized. (Applause.)

Accounts.

The PRESIDENT said the first item on the Agenda was a presentation of the balance-sheet. This was printed in the last volume of the Journal issued to members early this year, and it would no doubt be their wish that it should be taken as read. The Show Accounts were in the hands of those present.

Adoption of Report.

The PRESIDENT said that the Report of the Council had been circulated through the post to each Governor and Member of the Society, and the

meeting would probably be willing that this also should be taken as read.

Mr. J. E. QUESTED said it was with the greatest possible pleasure he rose to move that the Report be received and adopted. He was very pleased to learn from the President's opening remarks of the satisfactory financial position of the Society, and he hoped that the Council would consider exhibitors of stock when getting out the Schedule for the forthcoming Show. This question had been raised last year by Mr. Cridlan. He did not know if the Council had discussed it, but he did hope that in the coming year some relief in entry fees would be given to stock exhibitors.

He noted that the Society had made representations before the Departmental Committee now sitting to consider the question of the amendment of the Fertilizers and Feeding Stuffs Act. He was proud to belong to the county of Kent, from which, he believed, more samples were sent for analysis than from any other county. It was up to everybody purchasing fertilizers and feeding stuffs to see that he was getting the proper constituents guaranteed before he paid his bill. One point upon which he trusted there would be an amendment of the Act was that power would be placed in the hands of county councils, who had to administer the Act, to institute proceedings where necessary without obtaining the consent of the Ministry of Agriculture as they had at present to do. With regard to sheep scab he thought the whole of the flock owners of the country would welcome the new Order to which reference was made in the report.

There was just some slight remark in the report about foot-and-mouth disease, and he asked to be allowed to say a word on this terrible calamity which had overtaken the country. The question was going to be discussed to-morrow at the Agricultural Council, and there was a feeling in the country against the present policy of slaughter. All he could say was that the Ministry of Agriculture, in his opinion, and he thought in the opinion of all stock owners, was proceeding upon right lines. He understood that the United States had spent something like four million pounds in adopting the policy of slaughter and had stamped out this scourge from their country. Scandinavia had adopted similar measures and had also succeeded. Italy, too, had followed on similar lines. This, to his mind, was a good proof that the present policy in this country was the proper one. What they wanted to know was where these spontaneous outbreaks came from. (Hear, hear.) Until they found this out they were a little in the dark in dealing with foot-and-mouth disease.

Mr. C. H. JOLLIFFE said he would like to associate himself with the remarks that had fallen from Mr. Qusted. He thought they were all grateful to the Royal Agricultural Society for the strong and straight lines they adopted in anything that would help stock breeders and agriculturists. They knew what had been done regarding the Fertilizers and Feeding Stuffs Act and the Importation of Cattle, and he hoped the Society would now take that strong line with regard to foot-and-mouth disease. He did hope that the policy of slaughter would not be abandoned. He had heard rumours regarding a change of policy and the suggestion that stock owners should be left to cure animals as best they could. That, he thought, would be unfair. They were grateful for the help they had always received from the Royal Agricultural Society, and they looked forward to a continuance of that support. He had much pleasure in seconding the adoption of the report.

The EARL OF NORTHBROOK, referring to what had fallen from Mr. Qusted as to the policy which should be adopted by the Ministry of Agriculture with reference to the terrible outbreaks of foot-and-mouth disease which were unfortunately now prevalent throughout the country, said that this question had been before the Council of the Society that morning, and they were strongly of opinion that the wisest course was to persist in the policy of slaughter. He knew that there were objections to it coming from some parts of the country and he knew that the point

had been raised that the Government was spending vast sums of money without an equivalent result; but they must bear in mind that unless they paid this money, which was necessary in connexion with compulsory slaughter, the disease might become endemic in this country as it was on the Continent, and it might then be impossible to eradicate it from their flocks and herds. At the Council meeting the following resolution had been unanimously passed on the motion of Lt.-Col. Courthope, seconded by Mr. Christopher Middleton:—

"That this Council reasserts its conviction that the present policy of slaughter with compensation in cases of foot-and-mouth disease must be maintained, and offers strenuous opposition to all efforts to secure the discontinuation of this policy, unless the veterinary authorities definitely recommend such action."

The report of the Council, coupled with the endorsement of the resolution mentioned above, was then adopted.

Election of President.

Mr. RICHARDSON CARR said it was with the greatest possible pleasure, and he felt very great pride in it, that he had the honour to move a resolution that Mr. Ernest Mathews be elected President of the Society, to hold office until the next ensuing annual general meeting. He had been closely associated with Mr. Mathews for the past thirty-five years, and as regards qualifications no one was better fitted to occupy the position. Mr. Mathews became a member of the "Royal" in 1881, he joined the Council in 1904, and became Steward of Dairying in 1905. Everyone who knew him would agree that with regard to the dairy interest what Mr. Mathews did not know about it was not worth knowing. He was in every way qualified, and they could not get a better man. He had, as he had said, known Mr. Mathews for thirty-five years, and to know him was to love him; but Mr. Mathews suffered from the same disease as he himself did in being born too soon. Mr. Mathews had, however, got to that age when, he thought, he might live to be a hundred without any trouble at all. He personally felt a very strong regard for him, because Mr. Mathews once got him out of a great difficulty. Thirty-four years ago, Mr. Carr said, he had been asked by the late Lord Rothschild to see whether a butter test and milking trials could not be undertaken. He had approached the "Royal" at the time, but he was told that the trials could not be undertaken because there were practical difficulties in the way. His late chief, when he had told him of this decision, asked him if the trials could be carried out at a one-day show at Tring. Although he had not the slightest idea how it could be carried out, he never believed in saying that a thing could not be done. It is said "when you don't know, ask a policeman." His opinion was when in difficulties about dairying ask Mr. Mathews. Mr. Mathews had organized the butter test and milking trials at Tring, and made all the arrangements for testing 100 cows, and he used to get the awards out by half-past one. That spoke volumes for his capabilities. He (Mr. Carr) did not know a man who could be proposed as President who was more beloved than Mr. Mathews. He had never heard anyone say a word against him, and he had never heard Mr. Mathews say an unkind word about anyone. He had great pleasure in proposing the resolution.

Sir ARTHUR HAZLERIGG said it was his extraordinarily pleasant duty to second the motion so eloquently proposed by Mr. Richardson Carr. He could thoroughly endorse every word said by that gentleman about Mr. Mathews. He felt the Council had acted very wisely in bringing his name forward because he (Sir Arthur) did not know of anyone in his own department at the Show who combined the two qualities of "practical with science" more thoroughly than did Mr. Mathews. Mr. Carr was able to speak of Mr. Mathews' popularity in this country, but if members wanted to know how popular Mr. Mathews really was they ought to visit the

Island of Jersey with him as he, the speaker, had had the privilege of doing. It would be remembered that the late Government had suggested to the Jersey people that they should contribute a little sum to the Imperial Exchequer. They said "No." If the Government had known as much as he, they would have asked Mr. Mathews to make the request to Jersey, and they would have got anything they required. (Laughter.) Turning to the Show to be held next year, Sir Arthur said, as representing the County of Leicester on the Council of the Society, they would welcome Mr. Mathews very warmly as President for 1924, and they would do everything in their power to make the Show under his Presidency a great success.

Mr. ABEL SMITH, speaking as one who had known Mr. Mathews for a great number of years, also supported the resolution, which was then put to the meeting and carried with acclamation.

Mr. MATHEWS desired to say first of all how very much he appreciated the great honour done him in electing him President for 1924. He could assure those present that he felt it a tremendous honour, in fact he did not think that there was any post connected with agriculture in this country that could be compared with the Presidency of the Royal Agricultural Society. To his mind it was what might be called "the Blue Riband of Agriculture." It was an old saying that "he who puts on his clothes must not boast as he who takes them off." Therefore he would not say much regarding the Show to be held at Leicester next year. He would, however, thank Mr. Richardson Carr, Sir Arthur Hazlrigg, and his old friend Mr. Abel Smith, with whom he had played cricket many years ago, for the kind words they had spoken about him. They were far too kind. He was afraid that he would be rather conceited when he left that room, for he had no idea that he possessed all the qualities they had given him credit for. He felt that the Leicester Show was sure to be a success if they only got rid of foot-and-mouth disease. He thought it might be a trying year for the Society unless things improved. To meet that possibility, he hoped that, as suggested by the President, those present would do all they could to get new members, for they would want them all unless this disease was stamped out soon. The profits on the Show would be very much reduced if they did not have a big exhibit of cattle, sheep, and pigs, and they would be in the same position as they were at Doncaster. He did not think he need say one word about the support of the Council. He knew that his friend Colonel Stanforth would always be at hand to get him through the mazes of the new bye-laws. They probably were rather more simple than they looked, but he thought he would want some assistance there. He knew he could rely on Colonel Stanforth, and he knew he could rely on the assistance of the Council. Many of them were old friends of his, and he was sure that he would have the assistance of the new members, some of whom had been elected that day. If he had that support from the Members of the Council and also from Mr. Turner and his excellent staff he hoped to be in a position at the end of his year of office to thank them and report the success of the Leicester Show. The Mayor of Leicester was very hopeful that next year's Show was going to beat Newcastle. He hoped it might. He begged again to thank them for the great honour they had done him.

Election of Trustees.

The PRESIDENT announced that the following twelve trustees had been nominated by the Council in accordance with the bye-laws:—

H.R.H. the Prince of Wales, K.G., York House, St. James's Palace, S.W.1.
H.R.H. the Duke of York, K.G., White Lodge, Richmond.
C. Adeane, C.B., Babraham Hall, Cambridge.
Lord Allwyn K.C.V.O., K.B.E., Ironinghall, Norwich.
The Duke of Bedford, K.G., Woburn Abbey, Bedfordshire.
Sir J. B. Bowen-Jones, Bart., Council House Court, Shrewsbury
Col. F. S. W. Cornwallis, Linton Park, Maidstone, Kent.

The Earl of Coventry, Croome Court, Severn Stoke, Worcestershire.
The Duke of Devonshire, K.G., Chatsworth, Bakewell.
Sir Gilbert Greenall, Bart., C.V.O., Walton Hall, Warrington.
The Earl of Northbrook, Stratton, Micheldever, Hampshire.
The Hon. Cecil T. Parker, The Grove, Corsham, Wiltshire.

On a show of hands they were declared re-elected as trustees, to hold office until the next ensuing annual general meeting.

Election of Vice-Presidents.

The Vice-Presidents were elected in a similar manner, their names being :—

C. Coltman-Rogers, Stanage Park, Brompton Bryan.
Percy Crutchley, Sunninghill Lodge, Ascot, Berkshire.
The Earl of Derby, K.G., Knowsley, Prescott, Lancashire.
L. M. Greaves, Wern, Portmadoc, North Wales.
Lord Harlech, Brogyntyn, Oswestry.
Ernest Mathews, C.V.O., LL.D., Little Shardeloes, Amersham, Bucks.
The Duke of Portland, K.G., Welbeck Abbey, Worksop.
The Earl of Powis, Powis Castle, Welshpool, Mont.
Frederick Reyard, Sunderlandwick, Driffield, Yorkshire.
The Duke of Richmond and Gordon, K.G., Goodwood, Chichester.
Lt.-Col. E. W. Stanyforth, Kirk Hamerton Hall, York.
The Earl of Yarborough, Brooklesby Park, Lincolnshire.

Election of Auditors.

It was then moved by Mr. F. L. GOOCH, seconded by Mr. RANSOME, and unanimously resolved :—“ That the best thanks of the Society be tendered to Messrs. Jonas M. Webb, Hubert J. Greenwood, and Newell P. Squarey for their services as auditors, and that they be re-elected for the ensuing year.”

Elections to the Council.

In accordance with Bye-Law 87, the PRESIDENT reported the names of the following ordinary members of Council who had been elected to represent the several divisions of the Society included in Group A, so that the meeting might “ take cognizance ” of their election :—

Northumberland : G. G. Rea, Doddington, Wooler, L.S.O. ; C. H. Sample, 29 Grainger Street West, Newcastle-upon-Tyne ; Frederick Straker, Angerton Hall, Morpeth.
York (North Riding) : Major Olive Behrens, Swinton Grange, Malton ; J. R. Twentymann, Kirby Misperton Hall, Pickering.
Lancashire and Isle of Man : William Harrison, Albion Iron Works, Leigh ; T. B. Silcock, Arthfield House, Poulton-le-Fylde.
Cheshire : G. P. Miln, Abbot's Lodge, Chester ; R. B. Nelson, Holmwood, Sandiway ; Major C. W. Tomkinson, Willington Hall, Tarporley.
Derby : U. Roland Burke, Chatsworth, Bakewell ; Lt.-Col. H. E. D. Disbrowe-Wise, Walton Hall, Burton-on-Trent.
Northampton : F. H. Thornton, Kingsthorpe Hall, Northampton.
Norfolk : Davis Brown, Marham Hall, King's Lynn ; Hubert Groom, Sunderland, Docking, King's Lynn ; Henry Overman, Weasenham, King's Lynn.
Bedford : Benjamin Towkins, Bromham, Bedford.
Hertford : Richardson Carr, Mill Lawn, Burley, Brookenhurst, Hants.
Middlesex : A. W. Perkin, Greenford Green, Harrow.
Stafford : John Myatt, Lincoln House, Shensstone, Lichfield ; R. G. Patterson, Acton Hill, Stafford.
Worcester : Col. E. Vincent V. Wheeler, Newnham Court, Tenbury.
Monmouth : Col. Edward Currie, Itton Court, Chepstow.
Cornwall : Capt. George H. Johnstone, Trewithen, Granpound Road.
Dorset : Arthur Hiscock, Manor France Farm, Stourpaine, Blandford.
Hampshire and Channel Islands : T. W. Ashton, Estate Office, Hursley Park, Winchester ; James Falconer, Northbrook Farm, Micheldever Station.
Scotland : Robert Dickie, Knockenbig, Sanguhar, Dumfriesshire ; Andrew M. Montgomery, Netherhall, Castle Douglas.
Under Bye-law 88, Mr. William Burkill, of Grange Hill, Bishop Auckland, has also been elected as an additional representative on the Council for the Division of Durham.

Suggestions of Members.

In response to an enquiry by the PRESIDENT as to whether any Governor or Member had any remark to make or suggestion to offer for the consideration of the Council,

Sir DOUGLAS NEWTON said he had two suggestions to make. As the Council were aware, concessions had recently been made in connexion with the Entertainment Tax, and for the first time for several years the Society would be able to have a band. He suggested that seats should be placed round the bandstand and that some seating accommodation should be provided throughout the Show. His second suggestion was that a Rest Tent or Welfare Centre should be provided for the attendants in charge of the animals at the Show.

Sir GILBERT GREENALL, replying to Sir Douglas Newton, said that when the Society had a band at the Show seats were always placed round the bandstand. With regard to the other suggestion, it had been the practice to turn the restaurant part of the Workmen's Refreshment Pavilion into a room for the attendants at night so as to provide for them a place where they could sit down to read and write. Of course, it was quite impossible to provide a rest tent for every man who came to the "Royal," but everything they could do was done, and the men were made as comfortable as possible. Sir Gilbert added that he had never heard a grumble from anyone regarding this. Then, again, there was the big tent where meetings were held during the day. This was available for the men at night. It was, he knew, rather dark, but there were plenty of chairs where men could sit down. None of his men had ever grumbled about the accommodation provided at the "Royal."

Colonel GARRETT said it was felt that the agricultural engineers were inadequately represented upon the Council of the Society. They only wanted what was fair and just, and they only wanted the barest of either. Speaking as representing the implement manufacturers, members would, he thought, remember that in the Park Royal days the implement exhibitors had come up to the scratch, and always did the best they could for the Society. He believed it might be said that they had just the same chance of getting representatives on the Council as anyone else, but he did not think that was the case. Implement manufacturers were comparatively few, and when there was an election in a county they always gave way to agriculturists, but when it was considered that the implement exhibitors paid something like £4,000 a year towards the Society's Show, they did think that the Council might be asked to put their powers of co-optation into force, so that the implement manufacturers should be fully represented on the Council.

Mr. RANSOME supported the suggestion made by Colonel Garrett. He had had, he said, some experience of trying to get elected on the Council for his county, but it was useless to expect farmers and landowners to vote for anyone but their own class. It was practically impossible to get elected on the Council, but the agricultural engineers felt that they should have some share in the management of that great Society.

The PRESIDENT said that the suggestions which had been put forward would receive the consideration of the Council.

Thanks to the Retiring President.

The Hon. CECIL T. PARKER proposed a vote of thanks to Lt.-Col. Stanyforth, the retiring President, for his services during the year. When he had had the honour of nominating Col. Stanyforth for the position of President he had said that he was the right man in the right place, and he was sure they would all agree with him that what he had said had been fully justified. Col. Stanyforth had presided over their meetings with great courtesy, tact, and judgment, and they could not have had a better President.

Mr. C. W. TINDALL took it as a great honour that he had been allowed to second this vote of thanks to Col. Stanyforth, who had been known to him for a great number of years. Speaking for the Council, he desired to say how much they appreciated all the work that Col. Stanyforth had done and the manner in which he had done it. Mr. Tindall believed he was also speak-

ing for the whole of the Members of that great Society when he said that they appreciated very highly what had been done by their President.

The resolution having been carried with acclamation,

LT.-COL. STANYFORTH expressed his thanks to Mr. Parker and to Mr. Tindall and said that he was very deeply grateful. It was certainly a great pleasure to him that two gentlemen who had proposed and seconded him for election to that proud position should now ask the meeting to thank him for the services he had rendered. It had been to him a very pleasurable honour, because, as he had said last year, he felt it was the highest position which an English gentleman could wish to attain, and his successor had endorsed that view. He had striven for many years as a member of Council to do all in his power for that great Society and also as President for this year, and it was an enormous satisfaction to him to think that the North Country which he represented had done so much for the Society, because it had undoubtedly placed them in a financial position which would enable them to do more in the future than they had done in the past. It had been a great honour to him to act as President, but the duties had been enormously relieved by having a man like Sir Gilbert Greenall as Hon. Director, because a great deal of the thought and spare work had been done by him and by their excellent Secretary, and the President's duties were very much routine work. He had carried out that work to the best of his ability, and he could only thank them once again for having placed him in that position. He wished in some ways his year of office was not over. (Applause.)

Royal Agricultural Society of England.

AWARDS OF PRIZES AT NEWCASTLE-ON-TYNE, 1923.

ABBREVIATIONS.

- I., First Prize. II., Second Prize. III., Third Prize. IV., Fourth Prize.
V., Fifth Prize. R.N., Reserve Number. H.C., Highly Commended.
C., Commended.

The responsibility for the accuracy of the description or pedigree, and for the eligibility to compete of the animals entered in the following classes, rests solely with the Exhibitors.

Unless otherwise stated, each Prize Animal in the Classes for Horses, Cattle, Goats, Sheep, and Pigs, was "bred by Exhibitor."

HORSES.

Shires.

No. in
Data-
Table.

Class 1.—Shire Stallions, born in 1922.¹

- 4 I. (£20).—SIR BERNARD GREENWELL, BART., Marden Park, Woldingham, Surrey, for *Marden Goalkeeper*, black; s. Champion's Goalkeeper 30296, d. Chatley Fluff 102161 by Marden Peter 33356.
- 1 II. (10).—J. MORRIS BELCHER, Tibberton Manor, Newport, Salop, for *Tibberton Harbore*, brown; s. Harbore Nulli Secundus 33231, d. Tibberton Dorothy 55237 by Wood Eaton Blaze 19258.
- 3 III. (45).—JAMES FORSHAW AND SONS, Carlton-on-Trent, Newark, for *Member for Carlton*, brown, bred by F. W. Davenport, Knapthorpe, Cuntton, Newark; s. March King 34955, d. Knapthorpe Bonny by Beachenden Woodman 30146.
- 8 R.N.—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Chester, for *Eaton Nunsuch* 2nd. C.—2.

Class 2.—Shire Stallions, born in 1921.

- 20 I. (£20, & R. N. for Champion).—J. MORRIS BELCHER, Tibberton Manor, Newport, Salop, for *Tibberton Leader* 33033, dark bay; s. Pendley Leader 35071, d. Tibberton Secundus Queen 90699 by Babingley Nulli Secundus 26993.
- 11 II. (10).—JAMES FORSHAW AND SONS, Carlton-on-Trent, Newark, for *Dogdyke Jonathan* 35755, bay, bred by A. Scargill and Son, Withern, Alford, Lincs.; s. Marden John 32580, d. Burwell Flower 56404 by Lockinge Tag-of-War 19783.
- 13 III. (45).—JOHN C. JACKSON, The Grange, Askern, Doncaster, for *Pendley Commander* 38044, dark bay, bred by H. W. Bishop and J. W. Measures, Tring; s. Babingley Nulli Secundus 26993, d. Mother Hubbard 83830 by Royal Commander 30451.

Class 3.—Shire Stallions, born in 1920.

- 15 I. (£20, & Champion).—THE DUKE OF DEVONSHIRE, K.G., Chatsworth, Bakewell, for *Copenhagen Piar* 33110, bay, bred by Ernest W. Headington, Copenhagen Court, Slough; s. Monks Green Piar 55391, d. Fenny Menestrel Dolly 55351 by Norbury Menestrel 25343.
- 19 II. (10).—SIR BERNARD GREENWELL, BART., Marden Park, Woldingham, Surrey, for *Kilkenny Cecil* 38313, bay, bred by N. Hocken, Kilkenny Farm, Bibury; s. Capernwray 33063, d. Badsell Princess 70728 by Harlequin of Hothfield 33278.
- 22 III. (45).—E. SAVAGE, The Old Hall, Groby, Leicester, for *Lunesdale Banker* 33360, dark bay, bred by W. Taylor and Sons, Launds Farm, Hornby, Lancaster; s. Langrick Duke 33310, d. Hornby Belle 93674 by Kingsley 30591.
- 18 R.N.—JAMES GOULD, Crouchley Hall, Lymm, Cheshire, for *Lymm Clansman*. H.C.—14, 17. C.—21.

¹ Prizes given by the Shire Horse Society.

* Champion Gold Medal, and £5 to the Reserve, given by the Shire Horse Society for the best Stallion in Classes 1 to 3. A Prize of £5 is also given by the Shire Horse Society to the Breeder of the Champion Stallion, provided the Breeder is a Member of the Shire Horse Society, and the Dam of the animal is registered in the Shire Horse Stud Book.

lviii *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 4.—Shire Fillies, born in 1922.¹

- 26 I. (£20).—THE DUKES OF DEVONSHIRE, K.G., Chatsworth, Bakewell, for *Chatsworth May Queen*, bay; s. Field Marshal 5th 35827, d. Chatsworth Marian 84311 by Friar Tuck 4th 31447.
 30 II. (£10).—JAMES GOULD, Crouchley Hall, Lymm, Cheshire, for *Lymm Actress*, brown, bred by W. Maddocks Gibson, Hatgate Manor, Hilton, Derby; s. Ash Charmer 37050, d. Darling of Kirkby 83151 by Ashenden King 31165.
 29 III. (£5).—G. R. C. FOSTER, Anstey Hall, Trumpington, Cambridge, for *Invensure*, bay, bred by Percy Toone, Wolvey Grange, Hinckley; s. Primley Inventor 35096, d. Inham Bonny 98675 by Raglan 3rd 28698.
 25 R. N.—MAJOR G. H. BEXSON, Easthope, Much Wenlock, for *Lutwyche Liberty*.
 H. C.—33.

Class 5.—Shire Fillies, born in 1921.

- 35 I. (£20, & R. N. for Champion).—SIR ARTHUR NICHOLSON, Ilghfield Hall, Leek, for *Leek Pearl* 112124, bay; s. Champion's Goalkeeper 30296, d. Leek Destiny 85505 by Coronation 7th 29263.
 34 II. (£10).—G. R. C. FOSTER, Anstey Hall, Trumpington, Cambridge, for *Medmenham Princess* 112309, bay, bred by R. H. Keene, Westfield, Medmenham, Marlow; s. Weibek Redvitch 32924, d. Monton Princess 35800 by Longforth King Cole 30543.
 36 III. (£5).—H. S. TANBURN, White Meadow, Ashbourne, for *White Meadow Beryl* 113339, brown, bred by F. W. Lester Barnwood, Botolph, Claydon, Winslow; s. Abbotts Royal Blood 31147, d. Theale Betty 10045 by Theale Champion 31879.

Class 6.—Shire Fillies, born in 1920.

- 38 I. (£20).—A. H. CLARK AND SON, Moulton Bargate, Spalding, for *Moulton Messenger's Princess* 109180, bay; s. King's Messenger 31502, d. Moulton Victor's Duchess 82757 by Moulton Victor King 28590.
 37 II. (£10).—HIS MAJESTY THE KING, Sandringham, Norfolk, for *Lady of Lynn* 108735, bay; s. Lincoln John 35808, d. Lymm Vanity 89413 by Pendley Forest Prince 29715.
 40 III. (£5).—H. S. TANBURN, White Meadow, Ashbourne, for *West Dunley Pantomime* 110353, black, bred by P. W. Daniel, West Dunley, Grilton, Chippenham; s. Royal Sovereign 5th 33505, d. Pantomime of Hothfield 85988 by Kaiser of Hothfield 18453.

Class 7.—Shire Mares, born in or after 1919, with Foals at foot.

- 41 I. (£20).—SIR BERNARD GREENWELL, BART., Marden Park, Woldingham, Surrey, for *Chatley Fluff* 102161, bay, born in 1919, bred by J. and W. Bourne, Norton St. Philip, Bath; s. Marden Peter 33356, d. Chatley Queen 84308 by King Cole 7th 26351. [Foal by Champion's Goalkeeper 30296.]

Class 8.—Shire Mares, born in or before 1918, with Foals at foot.

- 48 I. (£20, & Champion).—F. S. FRECKLTON, Narborough Wood House, Enderby, Leicester, for *Pendley Lady* 99582, bay, born in 1918, bred by the late J. G. Williams, Pendley Manor, Tring; s. Champion's Goalkeeper 30296, d. Snelston Lady 72449 by Slipton King 26692. [Foal by Chamber Douglas 32245.]
 47 II. (£10).—G. R. C. FOSTER, Anstey Hall, Trumpington, Cambridge, for *Lincoln Duchess* 94098, bay, born in 1917, bred by E. T. Rutter, Salmonby, Horncastle; s. Ashenda King 31165, d. Daisy by Financier King 25138. [Foal by Champion's Goalkeeper 30296.]
 45 III. (£5).—DINAM ESTATES COMPANY, Llandinam, Mont., for *Gleadthorpe's Selection* 93269, bay, born in 1914, bred by T. L. Holley, Ryecroft, Retford; s. Chamber Forest King 27158, d. Haughton Bluebell 71060 by Royal Derby 16993. [Foal by Harboro' Nulli Secundus 32291.]
 49 R. N.—SIR EDWARD STERN, BART., Fan Court, Chertsey, for *Pendley Princess* 4th.

Class 9.—Shire Colt Foals, the produce of Mares entered in Class 7 or 8.¹

- 55 I. (£10).—SIR BERNARD GREENWELL, BART., Marden Park, Woldingham, Surrey; s. Champion's Goalkeeper 30296, d. Chatley Fluff 102161 by Marden Peter 33356.
 53 II. (£5).—G. R. C. FOSTER, Anstey Hall, Trumpington, Cambridge, for brown, born May 25; s. Champion's Goalkeeper 30296, d. Lincoln Duchess 94098 by Ashenden King 31165.
 54 III. (£3).—F. S. FRECKLTON, Narborough Wood House, Enderby, Leicester, for bay, born April 15; s. Chamber Douglas 32245, d. Pendley Lady 99582 by Champion's Goalkeeper 30296.
 52 R. N.—DINAM ESTATES COMPANY, Llandinam, Mont.

Class 10.—Shire Filly Foals, the produce of Mares entered in Class 7 or 8.¹

- 59 I. (£10).—SIR EDWARD STERN, BART., Fan Court, Chertsey, for *Fan Court Ella*, born April 10; s. Champion's Goalkeeper 30296, d. Pendley Princess 4th 99586 by Nulli Secundus 32243.

¹ Prizes given by the Shire Horse Society.

² Champion Gold Medal, and £5 to the Reserve, given by the Shire Horse Society for the best Mare or Filly in Classes 4 to 8. A Prize of £5 is also given by the Shire Horse Society to the Breeder of the Champion Mare or Filly, provided the Breeder is a Member of the Shire Horse Society, and the Dam of the animal is registered in the Shire Horse Stud Book.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. lix

Class 11.—Shire Geldings, by registered sires, born in 1920.¹

- 63 I. (£20).—S. LEGGATE AND SON, Dogdyke, Lincoln, for *Dogdyke Thumper*, bay, bred by T. H. Golding, Wrasbali, Shepton Mallet; s. Powisland Champion 28673, d. Choconate 73925 by Charterhouse Lion 25065.
 64 II. (£10).—B. A. CLEMINSON, Rawcliffe Manor, Skelton Road, York, for *Rawcliffe Darkie* 38347 (late Lincoln Marmion), black, bred by Joseph Streets, Claypole, Newark; s. Quenby Teamster 35107, d. Dry Doddington Black Bess 8465 by Ivy Champion 30589.
 64 III. (£5).—E. SAVAGE, The Old Hall, Groby, Leicester, for *Captain*, black, bred by the Ashby Potville Stud, Melton Mowray; s. Magna Nulli Secundus 34949, d. Potville May Queen 74505 by Blusterer 25943.
 62 R. N.—LT.-COL. J. A. DUNNINGTON-JEFFERSON, D.S.O., Thicket Priory, York, for *Thicket Albert*.

Class 12.—Shire Geldings, by registered sires, born in or before 1919.¹

- 74 I. (£20).—MILTON SCHOFIELD, Moss Farm, Alkington, Middleton Junction, Lancs, for *Alkington Darkie*, black, born in 1917, bred by G. Kendrew, Elm House, Northallerton; s. Lincoln Dray King 31590, d. Neasham Forest Maid 61301 by Ivy Forest Chief 23390.
 65 II. (£10).—MANN, CROSSMAN AND PAULIN, LTD., Albion Brewery, Whitechapel Road, London, E., for *Albion Wonder*, bay, born in 1918, bred by the Earl of Salfon, Croxteth, Liverpool; s. Coston Royal Albert 31289.
 66 III. (£5).—MANN, CROSSMAN AND PAULIN, LTD., for *Albion Duncan*, bay, born in 1918, bred by G. H. Bray, Dormington Court, Hereford; s. Blaisdon Draughtsman 32113, d. Bartestree Brenda 55985 by Boro' Menestrel 2nd 21180.
 67 R. N.—MANN, CROSSMAN AND PAULIN, LTD., for *Albion Wanderer*.
 H. C.—69, 70. C.—65, 72.

Clydesdales.

Class 13.—Clydesdale Stallions, born in 1922.²

- 83 I. (£20, & Champion).—ANDREW M. MONTGOMERY, Netherhall, Castle Douglas, for *Benefactor*, bay, bred by W. Melklem, Begg, Kirkcaldy; s. Fyvie Sensation 20612, d. Mast of Begg 50802 by Dunure Footprint 15203.
 82 II. (£10).—JAMES KIRKPATRICK, Craigiel Moine, Kilmarnock, for *Craigie Lord Roberts*, chestnut, bred by H. E. Roberts, Mereside, Bromfield; s. Craigie Litigant 19071, d. Galaxy 48866 by Dunure Footprint 15203.
 77 III. (£5).—ROBERT ELLWOOD, Hill Farm, Crosby, Maryport, Cumberland, for bay, bred by H. E. Roberts, Mereside, Bromfield, Abbey Town; s. Dunure True, 20329, d. Monk Molly 46321 by Anchenflower 12007.
 78 R. N.—JAMES GRAY, Birkenwood, Kippen Station, for *Guinea Stamp*.
 H. C.—76. C.—87.

Class 14.—Clydesdale Stallions, born in 1921.

- 92 I. (£20).—ANDREW M. MONTGOMERY, Netherhall, Castle Douglas, for Agent 20690, black, bred by W. Dunlop, Dunure Mains, Ayr; s. Dunure Footprint 15203, d. Dunure Hibernia 52144 by Dunure Statesman 17239.
 95 II. (£10).—DOUGLAS D. MURRAY, The Dene, Seaham Harbour, for *Fyvie Discovery* 20755, brown, bred by James Durno, Rothliebrishane, Fyvie; s. Birkenwood 19350, d. Lady Sylvia 47612 by Dunure Footprint 15203.
 91 III. (£5).—ALBERT JAMES MARSHALL, Bridgebank, Stranraer, for *Bridgebank Sensation* 20714, bay, bred by Robert Smith, Westfield, Winchburgh; s. Sunbeam 19560, d. Oceanla 46503 by Prince Ossian 16004.
 93 R. N.—ANDREW M. MONTGOMERY, for *Lord Advocate*.
 C.—69.

Class 15.—Clydesdale Stallions, born in 1920.

- 100 I. (£20, & R. N. for Champion).—ANDREW M. MONTGOMERY, Netherhall, Castle Douglas, for *Manning*, 20612, bay, bred by Peter Spence, Ringueina, Sandhead, Stranraer; s. Dunure Loyalty 19107, d. Ringueina Jessie 51374 by Rycroft 13722.
 99 II. (£10).—ALBERT JAMES MARSHALL, Bridgebank, Stranraer, for *Bridgebank Morning Star* 20515, black; s. The Dunure 16930, d. Miss McAlister 50869 by Dunure Footprint 15203.
 102 III. (£5).—DOUGLAS D. MURRAY, The Dene, Seaham Harbour, for *Seaham Ringleader* 20650, brown; s. Bonnie Buchlyvie 14032, d. Queen o' the Ring 46004 by Dunure Footprint 15203.
 98 R. N.—CRAMLINGTON COAL CO., LTD., Cramlington, for *Stephendale*.

Class 16.—Clydesdale Stallions, born in or before 1919.

- 106 I. (£20).—ANDREW M. MONTGOMERY, Netherhall, Castle Douglas, for *The Alien* 20473, bay, born in 1919, bred by J. R. Green, Collyhill, Bourtie, Inverurie; s. Hiuwatha Again 18765, d. Love of Collyhill 47867 by Signet 18816.

Class 17.—Clydesdale Fillies, born in 1922.²

- 118 I. (£20).—H. E. ROBERTS, Mereside, Bromfield, Carlisle, for *Mereside Mayflower*, black; s. Craigie Litigant 19071, d. Snowflake 48867 by Dunure Footprint 15203.

¹ Prizes given by the Shire Horse Society.

² Prizes given by the Clydesdale Horse Society.

³ Champion Silver Medal given by the Clydesdale Horse Society for the best Stallion in Classes 13-16.

ix Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.

- 117 II. (210).—DOUGLAS D. MURRAY, The Dene, Seaham Harbour, for *Seaham Moyna*, brown; *s.* Rising Star 18836, *d.* March Maiden 52780 by Bonnie Buchlyvie 14032.
 118 III. (25).—JAMES RILPATRICK, Craigie Mains, Kilmarlock, for *Craigie Ross*, chestnut, bred by R. Wilson, West Hurtle, Nithhill; *s.* Craigie Litigant 19071, *d.* Mary Rose 53249 by Dunure Footprint 15203.
 111 R. N.—JAMES DICKIE, Kilton House, Dumfries.
 C.—115. C.—112.

Class 18.—Clydesdale Fillies, born in 1921.

- 126 I. (220).—DOUGLAS D. MURRAY, The Dene, Seaham Harbour, for *Queen o' the Law*, dark brown; *s.* Craigie Litigant 19071, *d.* Queen o' the Ring 46998 by Dunure Footprint 15203.
 125 II. (210).—J. E. KERB, Harviestoun, Dollar, for *Harviestoun Florence*; *s.* Dunure Footprint 15203, *d.* Fiona 43334 by Royal Favourite 10630.
 121 III. (25).—ROBERT J. EBDON, Efford, Seahouses, Northumberland, for *Patricia*, black; *s.* Dunure Footprint 15203, *d.* Phyllis 52156 by Phillipine 18044.
 124 R. N.—JAMES GRAY, Birkenwood, Kippen Station, for *Meja*.

Class 19.—Clydesdale Fillies, born in 1920.

- 135 I. (220, & Champion).—T. AND M. TEMPLETON, Sandy Knowe, Kelso, for *Gladys*, brown, bred by H. E. Roberts, Merseide, Abbotsford; *s.* Auchendower 12007, *d.* Galaxy 4-866 by Dunure Footprint 15203.
 132 II. (210, & R. N. for Champion).—ALEXANDER MURDOCK, East Hallside, Hall-Id, Lanarkshire, for *Ophelia*, black, bred by A. Maxwell, Warrick, Irvine; *s.* Craigie Litigant 19071, *d.* Warrick Gray Maid 50894 by Dunure Footprint 15203.
 131 III. (25).—JAMES GRAY, Birkenwood, Kippen Station, for *Faith*, bay; *s.* Botha 19026, *d.* Senga 50313 by Apukwa 14567.
 129 R. N.—WILLIAM MOORE BLACK (of Australia), for *Musa*.
 H. C.—130.

Class 20.—Clydesdale Mares, with Foals at foot.

- 140 I. (220, & Champion).—DOUGLAS D. MURRAY, The Dene, Seaham Harbour, for *Seaham Ideal* 53307, roan, born in 1918; *s.* Auchendower 12007, *d.* Best Baroness 24035 by Baron of Buchlyvie 11263. [Foal by Dunure Footprint 15203.]
 136 II. (210).—DAVID ADAMS, Auchencraig, Dumbarton, for *Jenny Thom*, bay, born in 1920, bred by J. Hamilton, Dunduff, Ayr; *s.* Dunure Umpire 19711, *d.* Dunduff Lady 32847 by Baron of Buchlyvie 11263. [Foal by Dunduff Chancellor 20002.]
 133 III. (25).—JAMES GRAY, Birkenwood, Kippen Station, for *Elsie*, brown, born in 1918, bred by the late Stephen Mitchell, Boquhan; *s.* Botha 18026, *d.* Boquhan Shalla 43661 by Apukwa 14567. [Foal by Dunure Footprint 15203.]
 137 R. N.—R. T. ATKINSON, Acum Farm, West Auckland, for *Lady Hamlet*.
 141 (R. N. for Champion).—EDWARD NICHOI, Plessey North Moor Farm, Cramlington.

Class 21.—Clydesdale Geldings, by registered sires, born in or before 1920.³

- 149 I. (220).—SCOTTISH CO-OPERATIVE WHOLESALE SOCIETY, LTD., 95 Morrison Street, Glasgow, for *Jim Scott*, brown, born in 1918, bred by J. Scott, Ascurry, Forfar; *s.* Carbrook Buchlyvie 18273.
 147 II. (210).—WILLIAM MATHER, Milne Graden, Coldstream, for *Murphy*, bay, born in 1919; *s.* Mendel 14763, *d.* Queen of Bomby 46117 by Signet 16816.
 143 III. (25).—ASHINGTON COAL CO., LTD., Colliery Farms, Ashington, Northumberland, for *J.E.B.*, brown, born in 1919, bred by Miss Armstrong, Middleby Hill, Ecclefechan; *s.* Burch Chief 16471.
 148 R. N.—DOUGLAS D. MURRAY, The Dene, Seaham Harbour, for *Power*.
 H. C.—146. C.—144.

Suffolks.

Class 22.—Suffolk Stallions, born in 1922.⁴

- 155 I. (220).—SIR CUTHBERT QUILTER, BART., Bawdsey Manor, Woodbridge, for *Bawdsey Sulian* 5480; *s.* Bawdsey Hay 4188, *d.* Bawdsey Sulian 7081 by Sudbourne Arabi 3287.
 154 II. (210).—SIR CUTHBERT QUILTER, BART., for *Bawdsey Sparzgram* 5448; *s.* Framingham Allenby 4826, *d.* Bawdsey Hayward 9496 by Bawdsey Hay 4188.
 152 III. (25).—SAXTON W. A. NOBLE, Wretham Hall, Thetford, for *Wretham Sulian* 5389; *s.* Meudham Gold Boy 4225, *d.* Wretham Cherry 9555 by Clarion 3663.
 156 R. N.—A. CARLYLE SMYTH, Sutton Hall, Woodbridge, for *Ashmoor Augustus*.

¹ Champion Silver Medal given by the Clydesdale Horse Society for the best Mare or Filly in Classes 17-20.

² Silver Medal for the best Foal in Class 20, the property of a member of either the Northumberland or Durham County Agricultural Societies.

³ Prizes given by the Clydesdale Horse Society.

⁴ Prizes given by the Suffolk Horse Society.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. lxi

Class 23.—Suffolk Stallions, born in 1921.

- 157 I. (£20, & R. N. for Champion.)—THE EXORS. OF THE LATE LORD MANTON, Sudbourne Hall, Orford, Suffolk, for **Sudbourne Basil** 5332, bred by the late Lord Manton; s. Sudbourne Beau Brocade 4235, d. Selina 3329 by Angus 4455.
 158 II. (£10.)—ARTHUR T. PRATT, Morston Hall, Trimley, Ipswich, for **Whitehall Spark** 5364, bred by H. W. Daking, Whitehall, Thorpe-le-Soken; s. Preston Khedive 4486, d. Whitehall Princess 9519 by Preston Marshall 4420.
 159 III. (£5.)—SIR CUTHBERT QUILTER, BART., Bawdsey Manor, Woodbridge, for **Bawdsey Rex** 5294; s. Earl Gray 4219, d. Bawdsey Empress 7017 by Bawdsey Harvester 3076.

Class 24.—Suffolk Stallions, born in 1920.

- 161 I. (£20, & Champion.)—A. PRESTON JONES, Mickelover House, near Derby, for **Horstead Punchinello** 5096, bred by G. C. Neville, Horstead Hall, Norwich; s. Sudbourne Beau Brocade 4235, d. Nimble 8767 by Geo 4135.
 160 II. (£10.)—LT.-COL. W. E. HARRISON, O.B.E., Wychnor Park, Burton-on-Trent, for **Bawdsey Wassail** 5192, bred by Sir Cuthbert Quilter, BART., Bawdsey Manor, Woodbridge; s. Bawdsey Hay 4188, d. Bawdsey Marigold 7460 by Bawdsey Marshal Key 3385.

Class 25.—Suffolk Fillies, born in 1922.*

- 165 I. (£20.)—ARTHUR T. PRATT, Morston Hall, Trimley, Ipswich, for **Morston Gold Signet** 12075; s. Morston Gold Guard 4234, d. Leah's Queen 7772 by Bawdsey Harvester 3076.
 167 II. (£10.)—J. F. TRISTLETON-SMITH, Pudding Norton Hall, Fakenham, for **Mortones Belle** 11832; s. Fakenham Peter 5053, d. Arabella 8703 by Sudbourne Arab 3287.
 166 III. (£5.)—A. CARLYLE SMITH, Sutton Hall, Woodbridge, for **Walpole Majolica** 11707, bred by Miss M. Gillett, Walpole Hatch, Halesworth; s. Samford Rufus 4712, d. Walpole Monica 8949 by Sudbourne Arab 3287.

Class 26.—Suffolk Fillies, born in 1921.

- 160 I. (£20.)—THE EXORS. OF THE LATE LORD MANTON, Sudbourne Hall, Orford, Suffolk, for **Sudbourne Areta** 11498, bred by the late Lord Manton; s. Sudbourne Beau Brocade 4235, d. Sudbourne Armada 8519 by Sudbourne Peter 3955.
 173 II. (£10.)—SIR CUTHBERT QUILTER, BART., Bawdsey Manor, Woodbridge, for **Bawdsey Sappho** 11350; s. Earl Gray 4219, d. Bawdsey Minerva 6449 by Bawdsey Harvester 3076.
 175 III. (£5.)—A. CARLYLE SMITH, Sutton Hall, Woodbridge, for **Ashmoor Aquilegia** 11318; s. Bawdsey Hay 4188, d. Ashmoor Anemone 8963 by Sudbourne Arab 3309.

Class 27.—Suffolk Fillies, born in 1920.

- 178 I. (£20, & R. N. for Champion.)—ARTHUR T. PRATT, Morston Hall, Trimley, Ipswich, for **Buchanan Whisper** 10763, bred by R. H. Williams, Alderton, Woodbridge; s. Earl Gray 4219, d. Whisper 6633 by Bawdsey Harvester 3076.
 180 II. (£10.)—A. CARLYLE SMITH, Sutton Hall, Woodbridge, for **Ashmoor Aconite** 10922; s. Bawdsey Hay 4188, d. Ashmoor Anemone 8903 by Sudbourne Arab 3309.
 177 III. (£5.)—THE EXORS. OF THE LATE LORD MANTON, Sudbourne Hall, Orford, Suffolk, for **Sudbourne Gem** 10872, bred by the late Lord Manton; s. Sudbourne Beau Brocade 4235, d. Diamond 9611 by Goldfinder 3011.
 179 R. N.—SIR CUTHBERT QUILTER, BART., Bawdsey Manor, Woodbridge, for **Bawdsey Peeress**.

Class 28.—Suffolk Mares, with Foals at foot.

- 183 I. (£20, & Champion.)—VISCOUNT ELVEDEN, C.B., C.M.G., M.P., Pyrford Court, Woking, for **Morston Golden Girl** 9945, born in 1918, bred by A. T. Pratt, Morston Hall, Trimley; s. Morston Gold Guard 4234, a. Morston Bella 8438 by Morston Hero 4067. [Foal by Morston Connaught 4590.]
 186 II. (£10.)—A. CARLYLE SMITH, Sutton Hall, Woodbridge, for **Ashmoor Bessie** 10367, born in 1919; s. Sudbourne Arab 3309, d. Ashmoor Belle by Taylor's Majestic 3527. [Foal by Shetley Harvest Chief 4393.]
 185 III. (£5.)—SIR CUTHBERT QUILTER, BART., Bawdsey Manor, Woodbridge, for **Bawdsey Hayseed** 9496, born in 1917; s. Bawdsey Hay 4188, d. Cliff Blossom 6180 by Boulge Conqueror 2667. [Foal by Framlingham Allenby 4326.]
 191 R. N.—A. PRESTON JONES, Mickelover House, near Derby, for **Monica**.

Class 29.—Suffolk Colt or Filly Foals, the produce of Mares in Class 28.†

- 189 I. (£10.)—SIR CUTHBERT QUILTER, BART., Bawdsey Manor, Woodbridge, for filly born April 18; s. Framlingham Allenby 4826, d. Bawdsey Hayseed 9496 by Bawdsey Hay 4188.
 188 II. (£5.)—A. PRESTON JONES, Mickelover House, near Derby, for **Mickelover Sultan**, colt, born Mar. 15; s. Preston Khedive 4486, d. Monica 6292 by Morston Honourable 4414.
 187 III. (£3.)—VISCOUNT ELVEDEN, C.B., C.M.G., M.P., Pyrford Court, Woking, for **Pyrford Patricia**, filly, born Feb. 23; s. Morston Connaught 4590, d. Morston Golden Girl 9945 by Morston Gold Guard 4234.

* The "Cotnamation" Silver Challenge Cup, value £50, given by the Suffolk Horse Society for the best Stallion in Classes 22-24.

† Prizes given by the Suffolk Horse Society.

‡ Champion Prize of £10 given by the Suffolk Horse Society for the best Mare or Filly in Classes 25-28.

lxii Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.

Class 30.—Suffolk Geldings, by registered sires, born in or before 1920.¹

- 192 I. (£20).—**Sir CUTBERT QUILTER, Bart.**, Bawdsey Manor, Woodbridge, for *Prince*, born in 1919; *s. Bowdsey Varlet* £300, *d. Cliff Blossom* £180 by *Boulogne Conqueror* 2667.
 191 II. (£10).—**A. PRESTON JONES**, Mickleover House, near Derby, for *Captain*, born in 1918, bred by the Rt. Hon. E. G. Pretyman, Orwell Park, Ipswich; *s. Morston Gold Guard* 4234, *d. Orwell Diamond* 7203 by *Mendham Boy* 3650.

Percherons.

Class 31.—Percheron Colts or Fillies, born in 1922.²

- 201 I. (£20).—**Mrs. ROBERT EMMET**, Moreton Paddox, Moreton Morrell, Warwick, for *Greyling Warrior* B. 170, grey colt; *s. Rhum* B. 53, *d. Semiramis* B. 351 by *Lichas* F. 98731.
 198 II. (£10).—**THOMAS COOK**, Hobland House, Bradwell, Gt. Yarmouth, for *Hobland Diana* B. 498, grey filly; *s. Perfection* B. 46, *d. Octavie* B. 58 by *Kalsom* F. 97384.
 194 III. (£5).—**CHARLES P. ACKERS**, Huntley Manor, Gloucester, for *Huntley Perseus* B. 209, grey colt; *s. Quotall* B. 41, *d. Prussienne* B. 182 by *Jallieu* 86306.
 197 R. N.—**CHIVERS AND SONS, LTD.**, Histon, Cambridge, for *Histon Trip End*.
 H. C.—199. C.—193.

Class 32.—Percheron Stallions, born in 1920 or 1921.

- 207 I. (£20, & Champion³).—**THOMAS COOK**, Hobland House, Bradwell, Great Yarmouth, for *Hobland Bellman* B. 189, grey, born in 1921; *s. Perfection* B. 46, *d. Octavie* B. 53 by *Kalsom* F. 97384.
 211 II. (£10, & R. N. for Champion⁴).—**EVENLODE STUD**, Sczincote, Moreton-in-Marsh, for *Evenlode Veracity* B. 135, black, born in 1921; *s. Quantelux* B. 35, *d. Farmer* B. 182 by *Forfait Junior* A. 40974.
 208 III. (£5).—**Mrs. ROBERT EMMET**, Moreton Paddox, Moreton Morrell, Warwick, for *Greyling Unique* B. 71, grey, born in 1920; *s. Nodius* B. 4, *d. Quasquette* B. 5 by *Lagor* F. 100612.

Class 33.—Percheron Stallions, born in or before 1919.⁵

- 215 I. (£20, & Champion⁶).—**Mrs. ROBERT EMMET**, Moreton Paddox, Moreton Morrell, Warwick, for *Rhum* B. 53, grey, born in 1917, bred by M. Chopin, La Bigottière, Bellevue, Montecene, France; *s. Lagor* F. 100516, *d. Mariska* F. 105941 by *Horcholt* F. 77760.
 218 II. (£10, & R. N. for Champion⁷).—**COE, H. F. HAMBRON, C.R.F.**, Coldham Hall, Bury St. Edmunds, for *Quapulet* B. 31, dark grey, born in 1916, bred by M. Crener Motais, Contrad du Perche, France; *s. Languier* F. 100640, *d. Hermine* F. 73775 by *Guibert* F. 67805.
 214 III. (£5).—**CO-OPERATIVE WHOLESALE SOCIETY, LTD.**, Cobham, Wisbech, for *Salammbô* B. 86, iron grey, born in 1918, bred by Barbe la Cour, Marollette, France; *s. Lyonnals* F. 102780, *d. Lapiniere* F. 103878 by *F. Hepatisme* 75808.
 217 R. N.—**Mrs. ROBERT EMMET**, for *Salax*.
 H. C.—221.

Class 34.—Percheron Fillies, born in 1921.

- 228 I. (£20, & Champion⁸).—**HENRY R. OVERMAN**, Brampton Ash, Market Harborough, for *Brampton Eve* B. 431, dark grey; *s. Lagor* B. 1, *d. Iron* B. 23 by *Chamarg* F. 61297.
 227 II. (£10, & R. N. for Champion⁹).—**HENRY R. OVERMAN**, for *Brampton Eunice* B. 429, grey; *s. Levor* B. 1, *d. Nudale* B. 22 by *Johville* F. 88611.
 224 III. (£5).—**CHIVERS AND SONS, LTD.**, Histon, Cambridge, for *Histon Bonny* B. 371, dark grey, bred by John Chivers, Wychfield, Cambridge; *s. Lagor* B. 1, *d. Pochette* B. 181 by *Lori* F. 102083.

Class 35.—Percheron Fillies, born in 1920.

- 230 I. (£20, & R. N. for Champion¹⁰).—**CHIVERS AND SONS, LTD.**, Histon, Cambridge, for *Utache* B. 508, grey, bred by M. Besnier, Bout-du-Bos, Orléans les Roux, France; *s. Quatvados* F. 131498, *d. Officielle* F. 119963 by *Jolicoeur* F. 85324.
 235 II. (£10).—**HENRY R. OVERMAN**, Brampton Ash, Market Harborough, for *Brampton Diana* B. 273, grey; *s. Misanthrope* B. 5, *d. Quartelotte* B. 19 by *Simon* F. 99810.
 231 III. (£5).—**THOMAS COOK**, Hobland House, Bradwell, Gt. Yarmouth, for *Hobland Chille* B. 282, grey; *s. Misanthrope* B. 5, *d. Quance* B. 57 by *Lyeon* F. 103544.

¹ Prizes given by the Suffolk Horse Society.

² Prizes given by the British Percheron Horse Society.

³ Perpetual Silver Challenge Cup, value Fifty Guineas, given by the British Percheron Horse Society for the best Two-year-old Percheron Stallion in Class 32 born in Great Britain.

⁴ Perpetual Silver Challenge Cup, value Fifty Guineas, given by the British Percheron Horse Society for the best Percheron Stallion in Classes 31-33.

⁵ Perpetual Silver Challenge Cup, value Fifty Guineas, given by the British Percheron Horse Society for the best Percheron Filly in Class 34 born in Great Britain.

⁶ Perpetual Silver Challenge Cup, value Fifty Guineas, given by the British Percheron Horse Society for the best Percheron Mare or Filly in Classes 34-36.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. lxiii

Class 36.—Percheron Mares, with Foals at foot.

- 241 I. (230, & Champion.)—MRS. ROBERT EXMET, Moreton Paddox, Moreton Morrell, Warwick, for *Qualamite* B. 4, light grey, born in 1916, bred by Mons. Breux, La Cour, Mamets, France; s. *Lyonnais* F. 102760, d. *Montre* F. 106607 by *Herion* F. 81155. [Foal by *Rhinus* B. 53.]
 242 II. (210).—CHIVERS AND SONS, LTD., Histon, Cambridge, for *Ogive* B. 496, grey, born in 1914, bred by P. Chalopin, Rouille; s. *Instar* P. 78857, d. *Pascaline* F. 60629 by *Glacial* F. 44984. [Foal by *Nichet* F. 117897.]
 243 III. (25).—MRS. ROBERT EXMET, for *Messaline* B. 211, grey, born in 1912, bred by Mons. Demance, Blavet, Pervochères, Mortagne, France; s. *Douxreux-Couvreur* P. 58335, d. *Paquerette* F. 87642 by *Vollieur* P. 41888. [Foal by *Rhinus* B. 54.]
 246 R. N.—LT.-COL. SIR MERRIK R. BURRELL, BART., C.P.E., Kimp Castle, Hursham, for *Palombe*.
 H. C.—247.

Class 37.—Percheron Colt or Filly Foals, the produce of Mares in Class 36.²

- 250 I. (210).—CHIVERS AND SONS, LTD., Histon, Cambridge, for dark grey colt, born Mar. 3, s. *Brilliant* H. B. 42, d. *Petronne* B. 176 by *Japon* F. 84819.
 251 II. (25).—CHIVERS AND SONS, LTD., for black colt, born April 13; s. *Nichet* F. 117897, d. *Ogive* B. 496 by *Instar* F. 78857.
 257 III. (23).—MISS R. M. HARRISON, O.B.E., Maer Hall, Newcastle, Staffs, for black filly, born May 18; s. *Ortho* B. 22, d. *Quitana* B. 90 by *Lagor* F. 106512.

Hunters.

Class 38.—Hunter Colts or Geldings, born in 1922.

- 260 I. (220).—DINAM (ESTATES COMPANY, Llandinam, Mont., for *Absalom*, brown colt-bred by David Davies, M.P., Llandinam; s. *Bachelor's Charm* 161 d. *Judith*.
 268 II. (210).—MAJOR THOMAS THOMSON, Spotsmans, Kelso, for *Motard*, chestnut gelding; s. *Billidere*, d. *Pyjamas* 5329 by *Pantomime*.
 268 III. (25).—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for *Cranberry*, bay gelding; s. *Crathorne*, d. *Heather* 3rd 4106 by *Scotch Sign*.
 269 R. N.—THOMAS AND HENRY WARD, Pinchinthorpe, Guisborough, for *Cato*.

Class 39.—Hunter Geldings, born in 1921.

- 274 I. (220).—DINAM ESTATES COMPANY, Llandinam, Mont., for *Abzer*, bay, bred by David Davies, M.P., Llandinam; s. *Bachelor's Image*, d. *Judith*.
 273 II. (210).—ARTHUR S. BOWLEY, Gilston Park, Harlow, for *Blue Boy* (Supp. 260), chestnut; s. *Dirigal*, d. *Half Blue* 4446 by *Fighting Priest*.
 278 III. (25).—A. C. PATON, Whitehill, St. Boswells, for *Bay Ram*, bay; s. *Huntly Hawk* 186, d. *Ladysmith* by *Battlefield*.
 272 R. N.—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for *D.S.O.*

Class 40.—Hunter Geldings, born in 1920.

- 283 I. (220).—ARTHUR S. BOWLEY, Gilston Park, Harlow, for *The Tory* (Supp. 561), chestnut, bred by the Rev. E. T. Murray, Bourton-on-the-Hill, Glou.; s. *Political*, d. *Prudence* 4th 5029 by *Puro Castor*.
 284 II. (210).—JOHN DARRY, Hillmorton, Rugby, for *The Knight*, chestnut, bred by Walter Lofthouse, Bishopthorpe, York; s. *Sir Harry*.
 285 III. (25).—MAJOR AND MRS. E. A. DODD, The Paddocks, Elstouham, Essex, for *Happy-go-Lucky* (Supp. 571), chestnut, bred by S. Smith, Hole Farm, Stamford, Essex; s. *Dirigal*, d. *Lady Bird* 11th 5880 by *Scotch Hazel*.
 286 R. N.—FORSTER HALL, Humber House Farm, Lanchester, for *Leader*.

Class 41.—Hunter Fillies, born in 1922.

- 297 I. (220, & R. N. for Champion.)—MOFFAT S. THOMSON, Spotsmans, Kelso, for *Miss Murphy*, brown; s. *Billidere*, d. *Nanita* by *Ninos*.
 290 II. (210).—WILLIAM COCHRAN CARR, Lower Undercree, Newcastle-on-Tyne, for *Red Kays*, chestnut; s. *Ruthurde*, d. *Red Gauntlet* 3738 by *Red Salib* 75.
 293 III. (25).—LT.-COL. ROLAND GWYNNE, D.S.O., D.L., Folkington Manor, Polegate, for *Michelham Primrose* 6164, liver chestnut; s. *Cock-a-hoop*, d. *Michelham Jane* 5833.
 295 R. N.—WALTER LOFTHOUSE, Bishopthorpe, York, for *Guesswork*.

Class 42.—Hunter Fillies, born in 1921.

- 310 I. (220, & Champion.)—J. A. ROBSON-SCOTT, Newton, Jellburgh, for *Delvigne*, bay or brown; s. *Fowling-piece*, d. by *Gold*.

¹ Perpetual Silver Challenge Cup, value Fifty Guineas, given by the British Percheron Horse Society for the Best Percheron Mare or Filly in Classes 34–36.

² Prizes given by the British Percheron Horse Society.

³ Champion Gold Medal given by the Hunters' Improvement and National Light Horse Breeding Society for the best Filly not exceeding three years old in Classes 41–43, which must be either registered in the Hunter Stud Book, or the entry tendered within a month of the Award.

lxiv Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.

- 308 II. (210.)—JOHN HUNTER, Dilston, Corbridge, for *Star of Bethlehem* 6064, chestnut; *s.* Bethlehem, *d.* Fatherless 8978 by Battlefield.
 311 III. (25.)—W. H. SHERRS, Needwood House, Burton-on-Trent, for *Tinkerbell* 6046, chestnut; *s.* Peter Pan, *d.* Beechout 2nd 3284.
 309 R. N.—WALTER LORTHOUSE, Bishopthorpe, York, for *Gaiety* 4th.

Class 43.—Hunter Fillies, born in 1920.

- 312 I. (220.)—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for *Halcyon* 5879, chestnut; *s.* Feisham, *d.* Heather 3rd 4106 by Scotch Sign.
 314 II. (210.)—MAJOR C. B. HORNBY, Anick Cottage, Hexham, for *Stella*, chestnut; *s.* Bethlehem.
 315 III. (25.)—LORD LECONFIELD, Petworth House, Sussex, for *Patty*, chestnut; *s.* Craethrone, *d.* Patricia.
 317 R. N.—K. A. WILSON, New Houses, Capheaton, Newcastle-on-Tyne, for *Golden Braeiel*.

Class 44.—Hunter Mares (Novice), with Foals at foot.

- 318 I. (220, & Champion.)—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for *Flemish Queen* 6151, bay, born in 1911, bred by the late Earl of Feversham, Duncombe Park, Helmsley, Yorks; *s.* Pericles, *d.* Boadicea 2nd by St. David. [Foal by Sir Harry.]
 320 II. (210.)—ARTHUR S. BOWLEY, Gilston Park, Harlow, for *Lady Grace* 3rd 5759, chestnut, born in 1919; *s.* Darigal, *d.* Grace Darling 3rd 4098. [Foal by Scarlet Rambler.]
 322 III. (25.)—FORSTER HALL, Humber House Farm, Lanchester, for *Eileen* 4th 6125, chestnut, born in 1914, bred in Ireland; *s.* Mascot, *d.* by Braes Fraud. [Foal by Chance Bird.]

Class 45.—Hunter Mares, with Foals at foot.

- 325 I. (220, & R. N. for Champion.)—SIR ARTHUR J. DORMAN, K.B.E., Grey Towers, Nunthorpe, Yorks, for *Swift* 5003, bay, born in 1914; *s.* Tennis Ball, *d.* Ladybird 9th 4506. [Foal by Ednam.]
 329 II. (210.)—ROBERT ADAM WILSON, New Houses, Capheaton, Newcastle-on-Tyne, for *Buntie* 6085, bay, born in 1907, breeder unknown. [Foal by Rapier.]
 328 III. (25.)—W. H. SHERRS, Needwood House, Burton-on-Trent, for *Clematis* 5764, bay, born in 1912, bred by George Marton, Saiton Manor, Birmingham, York; *s.* Denis Richard, *d.* Pineapple by Peppinister 31. [Foal by Tates.]

Class 46.—Hunter Colt Foals, the produce of Mares in Class 44 or 45.²

- 330 I. (210.)—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for *Prince Harry*, chestnut, born March 26; *s.* Sir Harry, *d.* Flemish Queen 6151 by Pericles.
 334 II. (25.)—ROBERT ADAM WILSON, New Houses, Capheaton, Newcastle-on-Tyne, for bay, born May 18; *s.* Rapier, *d.* Buntie 6085.
 333 III. (25.)—W. H. SHERRS, Needwood House, Burton-on-Trent, for bay, born April 16; *s.* Tates, *d.* Clematis 5764 by Denis Richard.
 331 R. N.—FORSTER HALL, Humber House Farm, Lanchester.

Class 47.—Hunter Filly Foals, the produce of Mares in Class 44 or 45.²

- 335 I. (210.)—ARTHUR S. BOWLEY, Gilston Park, Harlow, for *Lady Rambler*, chestnut, born April 7; *s.* Scarlet Rambler, *d.* Lady Grace 3rd 5759 by Darted.
 336 II. (25.)—SIR ARTHUR J. DORMAN, K.B.E., Grey Towers, Nunthorpe, for chestnut, born April 25; *s.* Ednam, *d.* Swift 5003 by Tennis Ball.

Polo and Riding Ponies.

Class 48.—Polo and Riding Pony Stallions, born in or before 1920, not exceeding 15 hands.

- 340 I. (£15, & R. N. for Champion.)—C. HOWARD TAYLOR, Middlewood Hall, Barnsley, for *Field Marshal* 512, chestnut, born in 1907; *s.* Marchal Niel 363, *d.* Polo Queen 1217 by Boy of the Period.
 339 II. (210.)—C. J. PHILLIPS, Old Dalby Hall, Melton Mowbray, for *Demon* 2nd 1043, chestnut, born in 1915; *s.* Declare (Vol. 21, p. 1073), *d.* The Dowager (Vol. 18, p. 454) by Gervas.

¹ Champion Gold Medal given by the Hunters' Improvement and National Light Horse Breeding Society, for the best Mare four years old and upwards in Classes 44 and 45, which must be either registered in the Hunter Stud Book, or the entry tendered within a month of the Award.

² Prizes given by the Hunters' Improvement and National Light Horse Breeding Society.
³ Champion Gold Medal given by the National Pony Society for the best Stallion or Colt in Classes 48-50.

Awards of Live Stock Prizes at Newcastle-on Tyne, 1923. lxx

Class 49.—*Polo and Riding Pony Colts, Fillies or Geldings, born in 1922.*

- 346 I. (£15).—**TRESHAM GILBEY**, Whitehall, Bishop's Stortford, for **Golden Lock**, chestnut colt; *s.* Reform 1902, *d.* Lockett.
 343 II. (£10).—**HERBERT BRIGHT**, The Cove, Silverdale, Carnforth, for **Silverdale Betula**, dark brown filly; *s.* Cherry Tint 761, *d.* Silvery 2nd 4168 by Right Forard 308.
 347 III. (£5).—**LADY PENRHYN**, Wicken Park, Stony Stratford, for **Friar**, black colt; *s.* Prince Friarstown (Supp. 1917), *d.* Hannah Ann by Charl.
 344 E. N.—**CAPTAIN W. H. FRANCE-HAYHURST**, Bostock Hall, Middlewich, for **Roseleaf 2nd**.

Class 50.—*Polo and Riding Pony Colts, Fillies or Geldings, born in 1921.*

- 351 I. (£15, & Champion.)—**CAPTAIN W. H. FRANCE-HAYHURST**, Bostock Hall, Middlewich, for **Rosewood**, chestnut colt; *s.* Tantamount (Vol. 22, p. 707), *d.* Lady Brilliant 4169 by Field Marshal 512.
 355 II. (£10).—**LADY PENRHYN**, Wicken Park, Stony Stratford, for **The Quaker**, brown colt; *s.* Prince Friarstown (Supp. 1917), *d.* Hannah Ann by Charl.
 353 III. (£5).—**TRESHAM GILBEY**, Whitehall, Bishop's Stortford, for **Starlight 8th**, light bay filly; *s.* Goodward 948, *d.* Summer Town.
 349 E. N.—**HERBERT BRIGHT**, The Cove, Silverdale, Carnforth, for **Silverdale Faith**.

Class 51.—*Polo and Riding Pony Fillies or Geldings, born in 1920.*

- 357 I. (£15, & Champion.)—**TRESHAM GILBEY**, Whitehall, Bishop's Stortford, for **Good Mark** (Supp. 1921), bay filly; *s.* Goodward 948, *d.* Coming Down by Mark Forard.
 359 II. (£10).—**C. HOWARD TAYLOR**, Middlewood Hall, Barstley, for **Scarlatina** (Supp. 1920), chestnut filly; *s.* Red King (Vol. 23, 693), *d.* Pin 2908 by White Wings 461.
 356 III. (£5).—**CAPTAIN W. H. FRANCE-HAYHURST**, Bostock Hall, Middlewich, for **Coronet**, chestnut filly; *s.* Little Corona 814, *d.* Juliet 2nd (Supp. 1912) by Sandiway 121.

Class 52.—*Polo and Riding Pony Mares, with Foals at foot, not exceeding 14·2 hands.*

- 360 I. (£15, E. N. for Champion,¹ & Champion.)—**CAPTAIN W. H. FRANCE-HAYHURST**, Bostock Hall, Middlewich, for **Lady Brilliant 4169**, chestnut, born in 1914, bred by the Rev. W. C. Gosling, Woolley, Wakefield; *s.* Field Marshal 512, *d.* Rose Diamond by Rosewater 37. [Foal by French Eagle.]
 361 II. (£10, & E. N. for Champion.)—**TRESHAM GILBEY**, Whitehall, Bishop's Stortford, for **Waiting Maid 302**, bay, born in 1915, bred by Captain Noel R. Wills, Misenden Park, Cirencester; *s.* Arthur D. 593, *d.* Alberni 2835 by Right Forard 308. [Foal by Reform 1002.]

Arabs.

Class 53.—*Arab Stallions, any age.*

- 364 I. (£15).—**MAJOR G. H. BARKER**, The Gables, Lynding, Kent, for **Kobellian**, Bay bitten grey, born in 1912, bred by the late Emir Ibn Rachid, Hail Nejd.
 366 II. (£10).—**S. G. HOGGH**, Springhouse Park, Theydon Bois, Essex, for **Nuri Pasha**, grey, born in 1920; *s.* Nureddin 2nd, *d.* Ruth Kesia by Ben Azrak.
 365 III. (£5).—**R. F. H. B. COLTON-FOX**, Burythorpe House, Malton, for **Radium** (Vol. I, p. 59), chestnut, born in 1901, breeder unknown.
 367 E. N.—**S. G. HOGGH**, for **Shahzada**.
 H. C.—363. C.—368.

Class 54.—*Arab Mares, with Foals at foot.⁴*

- 370 I. (£15).—**S. G. HOGGH**, Springhouse Park, Theydon Bois, Essex, for **Amida**, chestnut, born in 1918, bred by The Crabtree Arabian Stud; *s.* Ibn Yashmak, *d.* Ajramek by Mesoud. [Foal by Shahzada.]
 372 II. (£10).—**BRIG.-GEN. F. F. LANCE**, Wentfield, Wrotham, Kent, for **Mejamieh**, bay, born in 1912. [Foal by Rasim.]
 371 III. (£5).—**S. G. HOGGH**, for **Hamida**, chestnut, born in 1909, bred by the late Lady Anne Blunt, Crabtree Park; *s.* Daoud, *d.* Hilmeyeh by Ahmar. [Foal by Shahzada or Nuri Pasha.]

¹ Champion Gold Medal given by the National Pony Society for the best Stallion or Colt in Classes 48-50.

² Champion Gold Medal given by the National Pony Society for the best Mare or Filly in Classes 49-52.

³ Bronze Medal given by the National Pony Society for the best Foal in Class 52 entered in the Supplement to the National Pony Stud Book.

⁴ Prizes given by the Arab Horse Society.

lxvi *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Cleveland Bays.

Class 55.—*Cleveland Bay Stallions, born in or before 1919.*

- 374 I. (£15.)—JOHN WELFORD, Spring Farm, Loftus, Yorks, for *Grange Lad* 1742, born in 1916; s. Aislaby Lad 1722, d. *Grange Beauty* 1356 by Pitch and Tess 1204.
 375 II. (£10.)—J. W. LETT, Scagglethorpe Manor, Malton, for *Toft House Lad* 1733, born in 1917, bred by G. Elders, Toft House, Aislaby, Yorks; s. Aislaby Lad 1722, d. Woodland Starlight 1323 by Woodland Pride 1659.

Class 56.—*Cleveland Bay Colts, Fillies or Geldings, born in 1921.¹*

- 376 I. (£15.)—J. W. LETT, Scagglethorpe Manor, Malton, for *Rillington Darling*, filly; s. Rillington Victor, d. Lady Adelaide 1373 by Cholderton Luck 1712.

Class 57.—*Cleveland Bay Colts, Fillies or Geldings, born in 1920.¹*

- 376 I. (£15.)—THOMAS KNAGGS, Tofts Farm, Marske-by-the-Sea, for *Salburne Queen* 1409, filly; s. *Grange Lad* 1744, d. Smiler 1375 by King George 5th 1718.
 377 II. (£10.)—J. W. LETT, Scagglethorpe Manor, Malton, for *Buckrose*, gelding; s. Rillington Victor, d. Rillington Victory 25 by Cholderton Luck 1712.
 378 III. (£5.)—JOHN G. WARD, Drumonby Grange, Stokesley, for *Yakron* 1749, colt, bred by J. M. Hall, Middlefield House, Stockton-on-Tees; s. Bendiam Brisseo 1734, d. Norton Lorna Doon 1387 by Aislaby Lad 1722.

Class 58.—*Cleveland Bay Mares, with Foals at foot.*

- 380 I. (£15.)—JOHN T. TINDALE, Ewe Cote Farm, Skiplam, Nawton, Yorks, for *Skiplam Pride* 1405, born in 1915; s. King George 5th, 1718, d. *Skiplam Beauty* 1806 by Fortunatus 962. [Foal by Tantalus 2544.]
 381 II. (£10.)—RALPH WELFORD, West Fields Farm, Loftus, Yorks, for *Grange Delight* 1400, born in 1918, bred by J. Welford, Grange Farm, Loftus; s. Loftus Favourite 1725, d. *Grange Trimmer* 1346 by Aislaby Hero 1696. [Foal by Grange Lad 1742.]

Coach Horses.

Class 59.—*Coaching Stallions, any age.*

- 382 I. (£15.)—J. W. LETT, Scagglethorpe Manor, Malton, for *Rillington Prince* 2632, born in 1920, bred by W. Slater, Beadlam, York; s. Rillington Victor 2536, d. Ryedale Princess 1342 by Rillington Primus 2572.

Class 60.—*Coaching Mares, with Foals at foot.*

- 384 I. (£16.)—J. W. LETT, Scagglethorpe Manor, Malton, for *Rillington Melody* 1343, born in 1920; s. Rillington Victor 2536, d. Rillington Attraction 1148 by Special Delight 2939. [Foal by Toft House Lad 2604.]

Hackneys.

Class 61.—*Hackney Stallions, born in 1921.²*

- 385 I. (£15.)—HENRY T. FELLOWAY, West Lavington, Wilts, for *Lavington Wayfarer* 13661, chestnut; s. Kirkburn Leader 12876, d. Criskeen Lawn 21945 by Terrington Recruit 9463.

Class 62.—*Hackney Stallions, born in or before 1920, over 14 hands.*

- 387 I. (£15, & Champion.³)—MRS. FLETCHER AND SONS, The Grange, Angram, York, for *Angram Majesty* 11967, dark chestnut, born in 1914, bred by the late Sir Walter Gilbey, Bart., Epsenham Hall, Essex; s. Flash Cadet 10293, d. Bold Princess 15613 by Royal Danegelt 5785.
 391 II. (£10, & R. N. for Champion.³)—SIR LEES KNOWLES, BART., C.V.O., O.B.E., Westwood, Pendlebury, Manchester, for *Salford Doron* 13701, black, born in 1920; s. King's Chamberlain 13407, d. Slashing Dorothy 23769 by Antonius 10559.
 388 III. (£5.)—WILLIAM GREXWOOD, Airedale Hackney Stud, Roundhay, Leeds, for *Airedale Proctor* 13340, chestnut, born in 1917; s. King's Proctor 11102, d. Belle Mere 21237 by Polonius 4931.
 393 R. N.—JOSEPH WILLIS, Polam Hackney Stud, Darlington, for *Mathias Danegelt*. G.—389, 392.

¹ Prizes given by the Cleveland Bay Horse Society.

² Prizes given by Members of the Hackney Horse Society.

³ Champion Prize of £10 given by the Hackney Horse Society for the best Stallion in Classes 61 and 62.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. lxvii

Class 63.—Hackney Fillies or Geldings, born in 1921.

- 395 I. (£15.)—WILLIAM GREENWOOD, Alredale Hackney Stud, Roundhay, Leeds, for **Airedale Carnation** 25764, chestnut filly; s. Bettrano 13288, d. Belle Mere 21237 by Polonus 4931.
 396 II. (£10.)—MRS. FLETCHER AND SONS, The Grange, Angram, York, for **Angram Birthday** 25773, chestnut filly, bred by W. Martin, Manor House, Stamford Bridge, York; s. Angram Majesty 11967, d. Princess Dora Mary 23735 by Buckingham Squire 8070.
 397 III. (£5.)—HENRY E. STEBBINS AND SONS, The Grange, Thornton, Melbourne, York, for **Hall Garth Express** 25742, chestnut filly; s. Angram Majesty 11967, d. Hall Garth Ophelia 25739 by Hall Garth Swell 11778.

Class 64.—Hackney Fillies or Geldings, born in 1920.

- 398 I. (£15, & Champion.)—ENOCH GLEN, Kaim Park, Bathgate, Scotland, for **Glenavon Relief** 25435, dark brown, bred by Alex. Morton, Gowankbank, Darvel; s. Adbolton Pearl King 12783, d. Heather Honey 23609 by Hailrig of Tower Hais 10692.
 400 II. (£10.)—HENRY T. HOLLOWAY, West Lavington, Wilts, for **Lavington Mattie** 25578, chestnut filly; s. Mathias A1 10751, d. Cruikshank Lann 21015 by Tertington Recruit 9463.
 399 III. (£5.)—WILLIAM GREENWOOD, Alredale Hackney Stud, Roundhay, Leeds, for **Airedale Leaderette** 25582, chestnut filly; s. Kirkburn Leader 12875, d. Belle Mere 21237 by Polonus 4931.

Class 65.—Hackney Mares, with Foals at foot.

- 401 I. (£15, & R. N. for Champion.)—J. E. RUSHWORTH, Eskdale, Bargate, Grimsby, for **Jolity** 23635, brown, born in 1912, bred by Robert Scott, Thornthorne, (Carlisle); s. Mathias 6473, d. Sweet Jessamine 11519 by Robert Elanero 2659. [Foal by Ophelus 13344.]
 402 II. (£10.)—HENRY T. HOLLOWAY, West Lavington, Wilts, for **Aphrodite Lavington** 24995, chestnut, born in 1919; s. Adbolton Kingmaker 12274, d. Aphrodite Danum 22088 by Cymanthorpe Performer 9670. [Foal by Bettrano 13288.]

Hackney Ponies.

Class 66.—Hackney Pony Stallions, born in 1921, not exceeding 13·2 hands.*

- 403 I. (£15, & R. N. for Champion.)—J. E. RUSHWORTH, Eskdale, Bargate, Grimsby, for **Tanyralt Gentleman Phil** 14121, bay, bred by D. R. Thomas, Tanyralt Pony Stud, Talybont; s. Tanyralt Sir Horace 12740, d. Phillis Melbourne 23281 by Melbourne Hall 11510.

Class 67.—Hackney Pony Stallions, born in or before 1920, not exceeding 14 hands.

- 408 I. (£15, & Champion.)—C. F. KENYON, Steele, Whittechurch, Salop, for **Bricket Fuelier** 13509, bay, born in 1918, bred by W. W. Bourne, Garston Manor, Watford; s. Fusee 12626, d. Colmo Marvel 23000 by Gentleman John 8624.
 406 II. (£10.)—ROBERT BLACK, The Grove, Osbalwick, York, for **Glenavon Gunfire** 13950, bay, born in 1920, bred by Enoch Glen, Kaim Park, Bathgate; s. Melbourne Shot 13055, d. Glenavon Princess Caprice 23129 by Fire Roy 7440.
 409 III. (£5.)—A. W. TUXBIDGE, Morevale Hackney Stud, Dordon Hall, Tamworth, for **Morevale Fusee** 13903, bay, born in 1920; s. Fusee 12626, d. Morevale Orphan 23243 by Fireboy 7440.
 407 R. N.—ROBERT HORNER, 39 Waterloo Road, Middlesbrough, for **Haughty Prince**.

Class 68.—Hackney Pony Mares, with Foals at foot, not exceeding 14 hands.

- 412 I. (£15.)—J. E. RUSHWORTH, Eskdale, Bargate, Grimsby, for **Diana Southworth** 25053, bay, born in 1917, bred by Joshua Ball, Southworth Hall, Warrington; s. Southworth Swell 11219, d. Southworth Merriment 21674 by Southworth Tissington 9898. [Foal by Successful 8314.]
 410 II. (£10.)—JAMES H. GODFREY, Middle Brinton Farm, Gosforth, Newcastle-on-Tyne, for **Dainty Melbourne** 24197, brown, born in 1914, bred by the late Walter G.H. Melbourne Hall, York; s. Melbourne Fire 12112, d. Dolly Walker 17255 by Successful 8314. [Foal by Southworth Swell 11219.]

* Champion Prize of £10 given by the Hackney Horse Society for the best Mare or Filly in Classes 63–65.

* Prizes given by Members of the Hackney Horse Society.

* Champion Prize of £10 given by the Hackney Horse Society for the best Stallion in Classes 66 and 67.

lxviii *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Dales Ponies.¹

Class 69.—Dales Pony Stallions, born in 1921 or 1922.

- 417 I. (♂10).—JOHN RUTHERFORD, Black Clough, Wearhead, Weardale, for *Weardale Periset* 1188, dark brown, born in 1922; s. North Star 2nd 600, d. Weardale Fashion 642 by *Highland Laddie* 3rd.
418 II. (♂5).—JOHN R. BOLDON, Moor View, Kenton, Northumberland, for *Eastern Star*, brown, born in 1921; s. Western Star 834, d. Nymph 3rd by *Moor Cock*.
415 III. (♂3).—JOHN W. DALTON, Snowhope Close, Stanhope, for *Sir John* 1136, brown, born in 1921, bred by J. A. Dixon, Borren House, Stainmore; s. *Pendragon Comet*, d. *Black Bess* 5th by *Red Fashion*.
414 R. N.—CAPTAIN T. S. CHRISTIE, Wardrew, Gisland, Carlisle, for *The Talisman*.

Class 70.—Dales Pony Stallions, born in 1920.

- 420 I. (♂10).—THOMAS V. EMERSON, Lane Head Farm, Stanhope, for *Jollie Laddie*, grey, bred by T. D. Hutchinson, Newbiggin, Carlisle; d. *Hazel*.
418 II. (♂5).—THOMAS BLACKETT, Low Westgarth, Butterknowle, for *Westgarth Comet* 1011, brown; s. Teasdale Comet 904, d. Westgarth Sprightly Spark 3587 by *Royal Rathe*.
422 III. (♂3).—JOHN TOWNSON, Hilton Moor, Evenwood Gate, Bishop Auckland, for *Merry Boy* 3rd, black; s. Linnel Comet 841, d. White Heather 5th by Teasdale Comet 904.
419 R. N.—ROY B. CHARLTON, Linnels, Hexham, for *Linnel Eclipse*.

Class 71.—Dales Pony Stallions, born in or before 1919.

- 427 I. (♂10).—JOHN RELPH, Turn Bank, Newby, Penrith, for *Dalesman* 572, brown, born in 1902, bred by the late R. Boustield, Whygill Head, Little Asby, Appleby; s. Yorkshire Fashion, d. Doll by *Reformer*.
426 II. (♂5).—R. H. HARRISON, High Scrogg Farm, Middleton St. George, Darlington, for *Hilton Jock* 965, grey, born in 1918, bred by John Townson, Hilton Moor; s. Mountain Ranger 508 Bell by *Red* 2nd (8491 Folly) by Teasdale Comet 904 Dales.
423 III. (♂3).—ROY B. CHARLTON, Linnels, Hexham, for *Gay Mannering* 937, black, born in 1919, bred by Mathew Dodd, Moscow, Gisland; s. Linnel Comet 841, d. Moscow Black Bess 3369.
424 R. N.—JOHN W. DALTON, Snowhope Close, Stanhope, for *Kirkdale Hero*.

Class 72.—Dales Pony Fillies, born in 1921 or 1922.

- 430 I. (♂10, & R. N. for Champion).—W. A. FEATHERSTONE, Pitt House, Tow Law, for *Snowdrop* 4th, brown, born in 1921, bred by J. Haunwell, Woodland; s. Brown Jock 575, d. Woodland Jess 4174 by *Dalesman* 572.
428 II. (♂5).—CAPTAIN T. S. CHRISTIE, Wardrew, Gisland, Carlisle, for *Lady Lingcroper*, black, born in 1921; s. Linnel Comet 841, d. Stonedress Polly 3206 by *Highland Laddie* 2nd.
434 III. (♂3).—C. W. RAINE, Low Way, Holwick, Middleton-in-Teesdale, for *Holwick Beauty* 4552, brown, born in 1922; s. Stanhope Hero 972, d. Holwick Lass 5806 by *Beacon Swell*.
429 R. N.—CAPTAIN T. S. CHRISTIE, for *Spray*.

Class 73.—Dales Pony Fillies, born in 1920.

- 441 I. (♂10).—MISS HILDA R. TOWNSON, Hilton Moor, Evenwood Gate, Bishop Auckland, for *Spicy Storey*, grey, bred by James Hutchinson, Copley Bent, Butterknowle; s. Teasdale Comet, d. Spicy Maid by Little John.
439 II. (♂5).—JOHN W. DALTON, Snowhope Close, Stanhope, for *Snowhope Rosemary* 4583, brown, bred by John Dargue, Bow Hall, Dufton; s. *Dalesman* 572, d. Nancy Gray 2263 by *Highland Laddie*.
437 III. (♂3).—CAPTAIN T. S. CHRISTIE, Wardrew, Gisland, Carlisle, for *Meg Morrillies* 2nd 3896, black; s. Linnel Comet 841, d. Stonedress Polly 3206 by *Highland Laddie* 2nd.
436 R. N.—JOSEPH ARMSTRONG, Middlestone Moor, Spinnymoor, for *Moor Pride*.

Class 74.—Dales Pony Mares, with Foals at foot.

- 450 I. (♂10, & Champion).—JOHN W. DALTON, Snowhope Close, Stanhope, for *Fairy Glance* 4126, brown, born in 1915, bred by George Haswell, Sandwath, Kirkby Stephen; s. Beacon Swell, d. Sally of Sandwath by Yorkshire Fashion. [Foal by *Kirkdale Hero* 965.]
451 II. (♂5).—P. W. SAYER, Rigg Farm, Lantington, Darlington, for *Grange Fashion* 3855, brown, born in 1916, bred by Thomas Cleasby, Grange Hall, Appleby, Westmorland; s. Beacon Swell, d. by Yorkshire Fashion. [Foal by *Stanhope Hero*.]
448 III. (♂3).—JOHN W. DALTON, for *Deedrop* 8748, bay, born in 1917, bred by Mr. Bell, Marwood, Barnard Castle; s. Bendle Squire, d. by Teasdale Comet 904. [Foal by *Kirkdale Hero* 968.]
443 R. N.—ROY B. CHARLTON, Linnels, Hexham, for *Linnel Martha*.

¹ £50 towards these prizes were given by the Dales Pony Improvement Society.

² The "Lewis Priestman" Challenge Cup given by the Dales Pony Improvement Society for the best Registered Mare or Filly in Classes 72-74.

Fell Ponies.

Class 75.—*Fell Pony Stallions, not exceeding 14 hands.*

- 452 I. (£10.)—JOSEPH BAXTER, Guardhouse, Threlkeld, Penrith, for **Mountain Ranger** 598, black, born in 1906, bred by J. W. Dent, Stibbleton-in-Teesdale; s. Park End King, d. Stordale Queen by Blooming Heather 323.
 454 II. (£5.)—THE EARL OF LOXSDALE, Lowther, Penrith, for **Hilton Fashion** 989, grey, born in 1917, bred by J. Townson, Hilton Moor, Evenwoodgate, West Auckland; s. Mountain Ranger 598, d. White Heather 2nd 2491 by Teesdale Cusnet 904.
 453 III. (£3.)—ROY B. CHARLTON, Linnels, Hexham, for **Linnel Heather** 888, black, born in 1918, bred by the late W. Carr, Blackhall, Hexham; s. Black Blooming Heather 674, d. Stonedress Polly 3206 by Highland Liddle 2nd.
 456 R. N.—JOHN RELPH, Turn Bank, Newby, Penrith, for **Blencathra**.

Class 76.—*Fell Pony Mares, with Foals at foot, not exceeding 13·2 hands.¹*

- 459 I. (£10.)—ROY B. CHARLTON, Linnels, Hexham, for **Linnel Flirt** 2916, black, born in 1913, bred by Henry Holme, Thrinley; s. Dalesman 572, d. Flora 2nd 2249 by Mighty Atom 382. [Foal by Guy Mannering 937.]
 458 II. (£5.)—JOHN BELLAS, Moor Farm, Keswick, for **Moor Daisy** 2nd (Vol. 18), brown, born in 1916; s. Moor Hero 742, d. Moor Daisy by Mountain King 5680. [Foal by Blooming Heather 2nd 674.]
 462 III. (£3.)—JOSEPH W. DENT, Fair View Farm, Middleton-in-Teesdale, for **Monks Fanny** 3883, black, born in 1916; s. Mountain Ranger 598, d. Stanhope Gate Fanny 2236 by Little John 599. [Foal by Linnel Heather 888.]
 461 R. N.—ROY B. CHARLTON for **Linnel Fancy**.

Welsh Mountain Ponies.²

Class 77.—*Welsh Pony Stallions, born in 1919, not exceeding 12 hands, or in 1920, not exceeding 11·3 hands, or in 1921, not exceeding 11·2 hands.*

- 465 I. (£15.)—MRS. 'A. C. LYELL, Ness Pony Stud, Neston, Cheshire, for **Ness King**, grey, born in 1920, bred by the Earl of Powis, Powis Castle, Welshpool; s. Stannage Daylight 248, d. Craven Gladys by Llwyn Cynro 407.
 464 II. (£10.)—MRS. H. D. GREENE, Grove, Craven Arms, for **Grove Squib**, grey, born in 1920; s. Shooting Star 73, d. Grove Sprite 2nd 4431 by Grove Ballisite 200.
 466 III. (£5.)—P. FITCH MASON, The Faraam, Killay, Glamorgan, for **Faraam Constellation** 1901, dark grey, born in 1920, bred by W. H. Rowe, Craven Arms; s. Shooting Star 73, d. Grove Stella 2866 by Grove Ballisite 200.

Class 78.—*Welsh Pony Stallions, born in or before 1918, not exceeding 12 hands.³*

- 467 I. (£15.)—MRS. H. D. GREENE, Grove, Craven Arms, Salop, for **Grove King Cole** 2nd 565, grey, was born in 1911; s. Grove King Cole 197, d. Diddia Tell Tale 343 by Tyrant 477.
 470 II. (£10.)—FREDERICK FITCH MASON, The Faraam, Killay, Glamorgan, for **Bwlch Quicksilver** 748, grey, born in 1912, bred by S. L. Morgan, Abergwillt; s. Dyoll Starlight 4, d. Lady Greylight 2046 by Greylight 80.

Class 79.—*Welsh Pony Mares, born in or before 1919, with Foals at foot, not exceeding 12 hands.*

- 472 I. (£15.)—GEORGE J. LYELL, Ness Pony Stud, Neston, Cheshire, for **Ness Thistle** 5821, grey, born in 1915, bred by Evan Jones, Cardigan; s. Shooting Star 73, d. Wedros Geia 3418 by Eidiwen Fyfer 3rd 5. [Foal by Talisman 696.]
 471 II. (£10.)—MRS. H. D. GREENE, Grove, Craven Arms, for **Grove Fairy Queen** 5469, chestnut, born in 1915; s. Shooting Star 73, d. Grove Fairy 2591. [Foal by Grove King Cole 2nd 565.]

¹ Prizes given by the Fell Pony Society.

² Silver Medals and Illustrated Certificates were given by the Welsh Pony and Cob Society to the First Prize Winner in each class.

³ Prizes given by the Welsh Pony and Cob Society.

Shetland Ponies.

Class 80.—*Shetland Pony Stallions, born in or before 1920, not exceeding 10·2 hands.*

- 474 I. (£15, & Champion.¹)—MRS. ETTA DUFFUS, Penniwells, Elstree, Herts, for Dibblits of Penniwells (Vol. 23, p. 63), black, born in 1920; s. Blitz 843, d. Diddy 2183 by Diamond 257.
 484 II. (£10.)—WILLIAM MITCHELL, Transy, Dunfermline, for Pat of Transy 776, black, born in 1912; s. Silverton of Transy 610, d. Princess Patricia 2559 by Peace 323.
 475 III. (£5.)—MRS. ETTA DUFFUS, for Huzzoo of Penniwells 864, black, born in 1911, bred by Charles A. Rehder, Kirkcawell, Kirkcudbright; s. Haldor 270, d. Barbara of Penniwells 2019 by Nautilus 571.
 473 R. N.—CHARLES DOUGLAS, Auchloch, Leamnahagow, for Phoebus of Auchloch.
 H.C.—477. C.—478.

Class 81.—*Shetland Pony Mares, with Foals at foot, not exceeding 10·2 hands.*

- 493 I. (£15, & R. N. for Champion.¹)—J. E. KERR, Harviestoun, Dollar, for Bagatelle 2895, black, born in 1909, bred by Mrs. Cholmley, Swindon; s. Thoreau 392, d. Banchoe 2434 by Haldor 270. [Foal by Drumlanrig 699.]
 489 II. (£10.)—MRS. ETTA DUFFUS, Penniwells, Elstree, Herts, for Maydew of Penniwells 3347, black, born in 1912; s. Dragon of Earlshall 5951, d. Maydy of Penniwells 2582 by Glencairn 314. [Foal by Huzzoo of Penniwells 864.]
 487 III. (£5.)—CHARLES DOUGLAS, Auchloch, Leamnahagow, for Bittma of Auchloch 3510, black, born in 1910; s. Thor 83, d. Belinda 1823 by Sigurd 137. [Foal by Phoebus of Auchloch 777.]
 497 R. N.—WILLIAM MITCHELL, Transy, Dunfermline, for Thoroeka of Transy.
 H.C.—493. C.—486.

Hunter Riding Classes.²

Class 82.—*Hunter Mares or Geldings, born in 1919.*

- 506 I. (£15.)—GUY FENWICK, North Luffenham Hall, Stamford, for Santa Gertrudis, bay mare; s. Santal, d. Ormeau by Ormandale.
 521 II. (£10.)—CHARLES E. STRAKER, High Warden, Hoxham, for Doola, bay gelding; s. Dennis Richard, d. Oola.
 507 III. (£5.)—MRS. A. C. GIBSON, The Stepping Stone, Catterick, for Buttered Toast, chestnut gelding, breeder unknown.
 517 IV. (£3.)—E. G. J. PYKE-NOTT and CAPTAIN RUPERT HIGGINS, Haines Hill, Taunton, for Dalesman, bay gelding, bred by J. Pearson, Rosedale, Pickering, Yorks; s. Blacksmith, d. by Bradgate.
 502 R. N.—JOHN DARBV, Hillmorton, Rugby, for Tanialus.
 H.C.—510.

Class 83.—*Hunter Mares or Geldings (Novice), born in or before 1919, up to from 12 to 14 stones.*

- 534 I. (£15, & Champion.¹)—JOHN DRAGE, Chapel Brampton, Northampton, for Browa Prince, bay gelding, born in 1918.
 551 II. (£10.)—WILLIAM YOUNG & SONS, Hill Crest Farm, Harraby, Carlisle, for Fairman, chestnut gelding, born in 1917, bred by W. J. H. Chapman, Cleveland House, Winslow; s. Castmon, d. Dorothy by Gold Medallist.
 506 III. (£5.)—GUY FENWICK, for Santa Gertrudis. (See Class 82.)
 520 IV. (£3.)—FRED E. MITCHELL, Fairbairn House, Cockermouth, for Aldersyde, chestnut gelding, born in 1918, bred by Miss Leatham, Aldersyde, York; s. Blacksmith, d. by Travelling Lad.
 521 R. N.—CHARLES E. STRAKER, High Warden, Hoxham, for Doola.

Class 84.—*Hunter Mares or Geldings (Novice), born in or before 1919, up to more than 14 stones.*

- 535 I. (£15, & R. N. for Champion.¹)—JOHN DRAGE, Chapel Brampton, Northampton, for Bayard, bay gelding, born in 1918.
 559 II. (£10.)—THE DUCHESS OF NEWCASTLE, Clumber, Worksop, for Repose, chestnut gelding, born in 1919; s. The Chair, d. Maria by Red Kangaroo.
 522 III. (£5.)—A. C. STRAKER, Hulgrave Hall, Tiverton, Torporley, for Our Pat, bay gelding, born in 1917, bred by Dr. Hickey, Ireland; s. Macana, d. by Warmister.
 515 IV. (£3.)—GEOFF KENTON, Plainville, Haxby, York, for bay gelding, born in 1919.
 H.C.—552.

¹ Champion Silver Medal given through the Shetland Pony Stud Book Society for the best Shetland Pony in Classes 80 and 81.

² Prizes given by the Newcastle Local Committee.

³ Gold Challenge Cup value Fifty Guineaes given by gentlemen interested in Hunters for the best Mare or Gelding in Classes 82–87.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. lxxi

Class 85.—Hunter Mares or Geldings, born in or before 1919, up to from 12 to 13·7 stones.

- 554 I. (£20).—JOHN DRAGE, for *Brown Prince*. (See Class 83.)
 551 II. (£15).—WILLIAM YOUNG & SONS, for *Fairman*. (See Class 83.)
 564 III. (£10).—MRS. R. E. E. SPENCER, Walcotte Hall, Newburn-on-Tyne, for *Michael*, bay gelding, born in 1917; s. *Koso Pepsue, d. Pretty Polly* by *Belleville*.
 521 IV. (£5).—CHARLES E. STRAKER, for *Doola*. (See Class 82.)
 517 V. (£3).—E. G. J. PYKE-NOTT and CAPTAIN RUPERT HIGGINS, for *Dalesman*. (See Class 82.)
 543 R. N.—CAPTAIN P. EUSTACE-SMITH, Whalton, Morpeth, for *Brown Sugar*.

Class 86.—Hunter Mares or Geldings, born in or before 1919, up to more than 13·7 and not more than 15 stones.

- 559 I. (£20).—THE DUCHESS OF NEWCASTLE, for *Repose*. (See Class 84.)
 533 II. (£15).—JOHN DRAGE, Chapel Brampton, Northampton, for *Moonshine*, chestnut gelding, born in 1918.
 518 III. (£10).—E. G. J. PYKE-NOTT and CAPTAIN RUPERT HIGGINS, Haines Hill, Taunton, for *Royal Scot*, chestnut gelding, born in 1918.
 552 IV. (£5).—WILLIAM YOUNG & SONS, Hillcrest Farm, Harbary, Carlisle, for *Goblin*, bay gelding, born in 1918.
 557 V. (£3).—ROBERT JOHNSON, Dene Head, Newburn-on-Tyne, for *Prospect*, bay gelding, born in 1917.

Class 87.—Hunter Mares or Geldings, born in or before 1919, up to more than 15 stones.

- 535 I. (£20).—JOHN DRAGE, for *Bayard*. (See Class 84.)
 515 II. (£15).—GEOFF KENTON. (See Class 84.)
 505 III. (£10).—JOHN DABBY, Hillmorton, Rugby, for *Magnesium*, chestnut gelding, born in 1916.
 539 IV. (£5).—G. B. RADCLIFFE, Pool Bank Farm, Tarvin, Chester, for *All Right*, chestnut gelding, born in 1918.
 560 V. (£3).—JOSEPH J. SUMMERBELL, South Shotton, Craudington, for *Attorney*, chestnut gelding, born in 1917.
 H. C.—556.

Hacks or Riding Ponies.¹

Class 88.—Mares or Geldings, not exceeding 13 hands. To be ridden by a child born in or after 1911.

- 569 I. (£15).—MRS. PHILIP HUNLOCK, Stylehurst Farm, Capel, Surrey, for *Ad Astra*, black mare, born in 1918.
 528 II. (£10).—MASTER JOHN STRAKER, Leazes, Hexham, for *Stagshaw Prince*, roan gelding, born in 1918, bred by Mrs. Straker, Stagshaw House, Corbridge; s. *Seren Cynra Flower of Wales 852, d. Pistyll Rosenet* by *Golden Gleam 212*.
 525 III. (£5).—MRS. J. C. STRAKER, Stagshaw, Corbridge, for *Rose of Stagshaw* (Vol. 20, p. 58), roan mare, born in 1920; s. *Seren Cynra Flower of Wales 852, d. Pistyll Rosenet* by *Golden Gleam 212*.
 568 R. N.—CHARLES A. DUNN, Red House Farm, Monkseaton, for *Red House Success*.

Class 89.—Mares or Geldings, over 13 and not exceeding 14 hands. To be ridden by a child born in or after 1909.

- 532 I. (£15, & R. N. for Champion).—W. W. BURDOP, Hartfield Hall, Bedlington, Northumberland, for *Irish Light*, chestnut gelding, born in 1916.
 571 II. (£10).—G. H. ALLGOOD, Nunwick, Humshaugh, Northumberland, for *Phoebe*, bay mare.
 572 III. (£5).—R. V. BEEBELEY, Spetchley Park, Worcester, for *Stephanie*, black mare, born in 1909, bred by the Earl of Kenmare, Killarney House, Killarney.
 500 R. N.—GUY C. B. ATKINSON, Dovecot House, Long Clawson, Melton Mowbray, for *Quicksilver*.
 H. C.—574. C.—575.

Class 90.—Mountain or Moorland Ponies, not exceeding 14·2 hands, registered in the Dales, Fell or Highland section of the National Pony Stud Book.²

- 445 I. (£10).—ROY B. CHARLTON, Linnels, Hexham, for *Robinson's Gipsy 3773*, black mare, born in 1917, bred by Mr. Ralph Maulds Mesburn, Fenith; s. *Glengarry 640, d. Queen of Hearts 2218* by *Dalesman 572*.
 579 II. (£5).—WILLIAM PATTERSON, 1 Hextol Terrace, Hexham, for *Snowflake 3750*, black mare, born in 1919, bred by E. Nichol, Hawkhope, Fairstone; s. *Highland Laddie 3rd 642, d. Suowstorm 3426*.

¹ Prizes given by the Newcastle Local Committee.

² Gold Challenge Cup, value Fifty Guineas, given by a member of the R.A.S.E., for the best Animal in Classes 88-92.

³ Prizes given by the National Pony Society.

lxxii Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.

- 581 III. (43.)—RICHARD WATSON, 2 Bank, Barnard Castle, for *Successful* 4484, black mare, born in 1918, bred by Mr. Wilson, Keswick; s. Moor Hero 742, d. Polly 2439 by Mountain King 5680.
 587 R. N.—SIDNEY W. LEWIS, Nowell House, Stocksfield, for *Blackie*.
 H. C.—444. C.—580.

Class 91.—Mares or Geldings, over 14 and not exceeding 15 hands.

- 584 I. (15.)—WILLIAM KENNEDY, The Garth, Monkton Village, Jarrow-on-Tyne, for *Miss Winkle*, chestnut mare, born in 1915.
 570 II. (10.)—MRS. PHILIP HUXLOE, Stylehurst Farm, Capel, Surrey, for *Syllabub*, chestnut mare, born in 1916, bred by Miss Calmady Hamlyn, Abbey Farm, Buckfastleigh; s. Barbed Fence, d. Junket.
 583 III. (45.)—CHARLES HUNTER, 3 Henderson Terrace, Jesmond, Newcastle-on-Tyne, for *Jesmond Fashion* 25105, brown mare, born in 1918, bred by M. Morland, Kenton, Newcastle-on-Tyne; s. Mathias 6473, d. Kitty Did 16820 by Healthy 7113.

Class 92.—Mares or Geldings, over 15 hands.

- 592 I. (15. & Champion.)—MISS WELLESLEY, Ford House, Churchinford, Honiton, for *Gabrielle* 2nd 5803, born in 1919, bred by W. Lofthouse, York; s. Tantamount, d. Giltiver 6014.
 588 II. (10.)—MISS JEAN DAVIDSON, Burnhead, Hawick, for *Rue*, black mare, born in 1918, bred by the Duke of Buccleuch, Dalkeith Palace; s. Sailor Lad, d. Pevitt by Melchior.
 590 III. (45.)—LADY FERRIS, Wicken Park, Stony Stratford, for *Oasis*, grey mare, born in 1918.
 524 R. N.—JOHN C. STRAKER, Stagshaw, Corbridge, for *Barton*.
 H. C.—545.

Driving Classes.²

SINGLE HARNESS.

Class 93.—Harness Mares or Geldings (Novice), not exceeding 14 hands.

- 605 I. (15.)—SAM HOLDSWORTH, 9 Stanmore Place, Lidgot Green, Bradford, for *Buckley Sunrise* 25511, bay mare, born in 1919, bred by C. F. Kenyon, Whitchurch, Salep; s. Successful 8314, d. Tessington Golden Ray 18091 by Gold Finder 6th 1791.
 595 II. (10.)—ROBERT BLACK, The Grove, Osbaldwick, York, for *Brashfield Tulle* 25534, bay mare, born in 1919, bred by Mrs. A. C. King, Brashfield Manor, Romsey; s. Harvest-ton Waddle 11469, d. Brashfield Chiffon 22414 by Berry Hill Snap 5758.
 568 III. (45.)—CHARLES A. DUNN, Red House Farm, Monkseaton, Northumberland, for *Red House Success*, bay mare, born in 1917, bred by H. Lister, Glenholme, Monkseaton; s. Take Fire King, d. Glenholme Success by Successful.
 577 IV. (43.)—MRS. T. E. FARRINGTON, Carley Hill, Sunderland, for *Sandy*, cream gelding, born in 1917.

Class 94.—Harness Mares or Geldings (Novice), over 14 and not exceeding 15 hands.

- 600 I. (15. & R. N. for Champion.)—ROBERT THOMSON, Cora Linn, Peckham, London, S.E., for *Cockierol*, bay gelding, born in 1919; s. Fusce 12826, d. Yett Mattee 21781 by Mathias 6473.
 582 II. (10.)—JAMES FORSTER, 13 Springbank Road, Jesmond, Newcastle-on-Tyne, for *Mosswood Saubeam* 25568, chestnut mare, born in 1912, bred by the late W. Burdett-Cloutts; s. Copmanthorpe Performer 9870, d. Cruise 18032 by Polonus 4931.
 583 III. (45.)—CHARLES HUNTER, for *Jesmond Fashion*. (See Class 91.)

Class 95.—Harness Mares or Geldings (Novice), over 15 hands.

- 596 I. (15. & Champion.)—ROBERT BLACK, The Grove, Osbaldwick, York, for *Gay Fashion* 302, chestnut gelding, born in 1918, bred by W. J. Tennant, Carleton, Pontefract; s. Carleton Quality 12535, d. Marole Lily 18406 by Royal Daugelt 5785.
 629 II. (10.)—CAPTAIN BERTRAM W. MILLS, Manor House, Little Berkhamsted, Herts, for black hackney.
 630 III. (45.)—CAPTAIN BERTRAM W. MILLS, for black hackney.
 598 IV. (43.)—RICHARD BELCHER, High Street, West Bromwich, for *Preston Adriatic* 24784, chestnut mare, born in 1918, bred by S. M. Thomson, Preston House, Lillingthorpe; s. Mathias 6473, d. Preston Pacific 20554 by Matchless of Lonsborough.
 607 R. N.—JAMES WRIGHT, Southlands Farm, Moutown, Leeds, for *Oakwood Beauty*.
 C.—594.

¹ Gold Challenge Cup, value Fifty Guineas, given by a member of the K.A.S.B. for the best animal in Classes 88-92.

² Prizes given by the Newcastle Local Committee.

³ Gold Challenge Cup, value Fifty Guineas, given by a Member of the Hackney Horse Society for the best Animal in the Novice Classes 83-95.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. lxxiii

Class 96.—Harness Mares or Geldings, not exceeding 13·2 hands.

- 630 I. (£15, Champion.) **E. N. for Champion.**¹ & **R. N. for Champion.**²—C. F. KENYON, Steele, Whitechurch, Salop, for *Arholme Venus* 24435, bay mare, born in 1918, bred by H. Gidding, Rockfield, Gatacre; s. Southworth Swell 11219, d. Talke Princess 21895 by Talke Fire King 9932.
- 624 II. (£10, & R. N. for Champion.)—WILLIAM S. MILLER, Balmanno Castle, Bridge of Earn, N.B., for *Miss Peda* 25780, bay mare, born in 1918, bred by John Blaken, Gale Farm, Wilberfoss, York; s. Melbourne Shot 13055, d. Kitten 12772 by Sir Horace 5402.
- 597 III. (£5.)—ROBERT BLACK, The Grove, Oswaldwick, York, for *Buckley Fame* G 178, bay gelding, born in 1917, bred by the late Walter Cliff, Melbourne Hall, York; s. Melbourne Shot 13055, d. Phyllis Melbourne 23281 by Melbourne Hall 11510.
- 609 IV. (£3.)—JOSEPH W. G. SMITH, Wensleydale Stud, Aysgarth, York, for *Naughty Fire* G 26, bay gelding, born in 1913, bred by H. Le Maremont, Elmwood, East Croydon; s. Torchüre 9472, d. Naughty Naid by Berkeley Model 3663.
- 608 R. N.—ROBERT HORNBER, 39 Waterloo Road, Middlesbrough, for *Little Aeroplane*. H. C.—588.

Class 97.—Harness Mares or Geldings, over 13·2 and not exceeding 14 hands.

- 595 I. (£15.)—ROBERT BLACK for *Braishfield Tulle*. (See Class 94.)
- 606 II. (£10.)—FRED BRADLEY, Craven Stud, Bingley, Yorks, for *Melbourne Gas* G.143, brown gelding, born in 1913, bred by the late Walter Cliff, Melbourne Hall, York; s. Melbourne Hall 11510, d. Success 2nd 12332 by Berkeley Model 3663.

Class 98.—Harness Mares or Geldings, over 14 and not exceeding 15 hands.

- 625 I. (£15, Champion.) & **Champion.**²—WILLIAM S. MILLER, Balmanno Castle, Bridge of Earn, N.B., for *Charm* 25396, brown mare, born in 1917, bred by Enoch Glen, Kahn Park, Bathgate; s. Harviestoun Mahatta 12650, d. Glenavon Pearl 23567 by Mathias 6473.
- 610 II. (£10.)—JOSEPH W. G. SMITH, Wensleydale Stud, Aysgarth, Yorks, for *Garston Madge* 23946, brown foan mare, born in 1914, bred by G. A. Cobb, Garston, Watford; s. Leopard 9728, d. Brompton Princess 5707 by Garston Duke of Connaught 3009.
- 582 III. (£5.)—JAMES FORSTER, for *Mosswood Sunbeam*. (See Class 94.)
- 583 IV. (£3.)—CHARLES HUNTER, for *Jesmond Fashion*. (See Class 91.)

Class 99.—Harness Mares or Geldings, over 15 and not exceeding 15·2 hands.

- 604 I. (£15.)—WILLIAM S. MILLER, Balmanno Castle, Bridge of Earn, N.B., for *Dark Legend* G.104, dark chestnut gelding, born in 1916, bred by D. A. Engel, Hemlington Park, Marton, Yorks; s. Mathias 6473, d. Hemlington Fairplay 21844 by Hopwood Victory 9280.
- 599 II. (£10.)—RICHARD BECHER, Iligh Street, West Bromwich, for *Knight Commander* G.106, chestnut gelding, born in 1913, bred by Mrs. E. C. Rodger, Bridglands, Selkirk; s. Mathias 6473, d. by Blaze 2nd 2376.
- 598 III. (£5.)—RICHARD BECHER, for *Preston Adriatic*. (See Class 95.)
- 630 IV. (£3.)—CAPTAIN BERTRAM W. MILLS, Manor House, Little Berkhamsted, for black hackney.

Class 100.—Harness Mares or Geldings, over 15·2 hands.

- 627 I. (£15.)—WILLIAM S. MILLER, Balmanno Castle, Bridge of Earn, N.B., for *Knight Errant* G.165, bay gelding, born in 1915, bred by Caleb Humphreys, Higher Transmere, Birkenhead; s. Mathias 6473, d. Calabar Canadian Girl 19815 by Garton Duke of Connaught 3009.
- 596 II. (£10.)—ROBERT BLACK, for *Gay Fashion*. (See Class 95.)
- 632 III. (£5.)—CAPTAIN BERTRAM W. MILLS, Manor House, Little Berkhamsted, for black hackney.
- 633 IV. (£3.)—CAPTAIN BERTRAM W. MILLS, for black hackney.
- 594 R. N.—H. P. WESTWICK, 51 Lyons Terrace, Lane Ends, Helton lo-Hole, for *Helton Rocket*.

DOUBLE HARNESS.

Class 101.—Pairs of Harness Mares or Geldings.

- 627 & 628 I. (£20, & Champion.)¹—WILLIAM S. MILLER, for *Knight Errant* (see Class 100); and *Knight Templar* G.156, bay gelding, born in 1917, bred by John Chivers, Wycheild, Cambridge; s. Mathias 6473, d. Inverness Duchess of Connaught 15192 by Garton Duke of Connaught 3009.
- 629 & 630 II. (£15, & E. N. for Champion.)²—CAPTAIN BERTRAM W. MILLS, for black hackney.
- 595 & 597 III. (£10.)—ROBERT BLACK, for *Braishfield Tulle* (see Class 93); and *Buckley Fame* (see Class 98.)

¹ Silver Challenge Cup, value Twenty-five Guineas, given by the National Terrier Club for the best Pony not exceeding 14 hands, in Classes 90 and 97.

² Gold Challenge Cup, value Fifty Guineas, given by Hackney Breeders interested in Harness Horses for the best Animal in Classes 96–100.

³ Champion Prize of £5 given by the Hackney Horse Society for the best Mare or Gelding in Classes 93–100, the produce of a registered Hackney Stallion.

⁴ The "Glasgow" Gold Challenge Cup, value Fifty Guineas, given by a member of the R.A.S.E., for the best Pair in Class 101.

lxiv *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

TANDEMS.

Class 102.—*Pairs of Harness Mares or Geldings.*

- 632 & 633 I. (£20, & Champion.)—CAPTAIN BERTRAM W. MILLS, for black hackneys.
 605 & 607 II. (£15, & R. N. for Champion.)—ROBERT BLACK, for *Braishfield Tulle* (see Class 93) and *Buckley Fame* (see Class 96).

Four-in-Hand Teams.

Class 103.—*Mares or Geldings.*

- 639 I. (£30, & Champion.)—W. A. BARRON, 91 Westbourne Terrace, London, W.2, for four chestnuts.
 634 II. (£20, & R.N. for Champion.)—CAPTAIN BERTRAM W. MILLS, for four blacks.

CATTLE.

Shorthorns.

Class 104.—*Shorthorn Bulls, born in or before 1920.*

- 647 I. (£15, Champion,¹ & Champion.)—ALBERT JAMES MARSHALL, Bridgebank, Stranraer, for *Bridgebank Paymaster* 154308, light roan, born Jan. 28, 1919; s. *Gairford Ringleader* 136657, d. *Princess Christina* by *Brookhicks Diamond* 124550.
 649 II. (£10, & R. N. for Champion.)—JOHN J. MOTHERAY, Naemoot, Rumbling Bridge, N.B., for *Garbity Field Marshal* 142541, red, born April 20, 1917, bred by James McWilliam, Garbity, Orton; s. *Edgote Flatterer* 125374, d. *Mabel* 10th by *Stoneytown King* 107167.
 650 III. (£5.)—THE DUKE OF NORTHUMBERLAND, Alnwick Castle, Northumberland, for *Ducal Favourite* 148518, white, born March 9, 1918; s. *Aldworth Duke* 123844, d. *Favourite Rosebud* by *Alnwick Favourite* 60653.
 643 R. N.—WILLIAM GARNE, Abington, Fairford, Glou., for *Curney Oxyer*.
 647, 661, 677 (Special, £15.)—ALBERT JAMES MARSHALL, for *Bridgebank Paymaster*, *Bridgebank Mahdi*, and *Bridgebank Silver Gift*.
 H. C.—651. C.—652.

Class 105.—*Shorthorn Bulls, born on or between January 1, 1921, and March 31, 1921.*²

- 662 I. (£15.)—ALBERT JAMES MARSHALL, Bridgebank, Stranraer, for *Calrossie White Esigue* 169930, white, born Feb. 18, bred by Captain J. MacGillivray, Calrossie, Nigg; s. *Doune Monarch* 155390, d. *Una Undine* by *Millicilla Rother* King 135020.
 653 II. (£10.)—ALEXANDER & ADOLF, Newbiggin, Cambus, N.B., for *Abbeymains Combatant* 168248, white, born Jan. 29, bred by Thomas Kirk, Abbeymains, Haddington; s. *Stoneytown Challenger* 159072, d. *Rambler Rose* by *Sanguhar Knight Marshal* 133424.
 661 III. (£5.)—ALBERT JAMES MARSHALL, for *Bridgebank Mahdi* 169540, dark roan, born Feb. 4; s. *Bridgebank Paymaster* 154308, d. *Jim's Mayflower* by *Rabicon* 110047.
 659 R. N.—GEORGE HARRISON, Gairford Hall, Darlington, for *Doune Meteor*.
 H. C.—658, 660, 665. C.—655.

Class 106.—*Shorthorn Bulls, born on or between April 1, 1921, and December 31, 1921.*³

- 667 I. (£15.)—JOSEPH BARNES & SON, Barugh Syke, Wigton, for *Balmerino White Cockade* 168813, white, born April 28, bred by J. Murray, Balmerino, Fife; s. *Eclipse of Collyzie* 136344, d. *Ellie* 39th by *Merry Victor* 116563.
 681 II. (£10.)—J. M. STRICKLAND, Balnossie, Caterick, for *Brandsby's Lord Ramsden* 7th 109462, roan, born June 2; s. *Brandsby's Undine* King 154226, d. *Brandsby's Miss Ramsden* 3rd by *Brandsby's Count* 6th 129815.
 670 III. (£5.)—G. L. T. BRIDGEMAN, Deene Park, Peterborough, for *Deene Lucanus*, roan, born May 7; s. *Bridgebank Paymaster* 154308, d. *Inverton Luxury* 43rd 1279 by *Drummond Chieftain* 142088.

¹ Gold Challenge Cup, value Fifty Guineas, given by a member of the R.A.S.E. for the best Tandem in Class 102.

² Gold Challenge Cup, value Fifty Guineas, given by a member of the R.A.S.E. for the best Team in Class 103.

³ Champion Prize of £20 given by the Shorthorn Society, for the best Bull in Classes 104-109. A Silver Medal is given by the Shorthorn Society to the Breeder of the Champion Bull.

⁴ The "Brothers Colling" Memorial Perpetual Challenge Cup, value 100 Guineas, given through the Durham Agricultural Committee for the best Shorthorn in Classes 104-114.

⁵ Special Prizes of £15 First Prize, and £10 Second Prize, given by the Shorthorn Society for the best groups of three animals bred by Exhibitor in Classes 104-114.

⁶ Prizes given by the Shorthorn Society.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. lxxv

- 668 **R. N.**—BILSINGTON SHORTHORN COMPANY, Bilsington Priory Home Farm, Ashford, Kent, for *Balcalra Warden*.
 681, 691, 736 (Special, £10.1.)—J. M. STRICKLAND, for *Brandsby's Lord Ramsden 7th*, *Bainesse Ramsden King* and *Brandsby's Princess 15th*.
H. C.—677, 678.

Class 107.—Shorthorn Bulls, born on or between January 1, 1922, and March 31, 1922.¹

- 659 **I. (£15, & Special, £10.2.)**—THE DUKES OF NORTHUMBERLAND, Alnwick Castle, Northumberland, for *Gay Scot*, red, born Jan. 12; *s. Alisworth Duke 12844*, d. *Gay Missie* (Vol. 62, p. 997) by *Alnwick Wizard 110747*.
 693 **II. (£10.)**—GEORGE ALFRED WILLS, Langford Court Farm, Langford, Bristol, for *Collynie Rubicon*, red, born March 14, bred by William Duthie, Collynie, Tarves; *s. Marquis of Milhills 137868*, d. *Rosebud 6th* (Vol. 56, p. 820) by *Diamond King 83201*.
 691 **III. (£5.1.)**—J. M. STRICKLAND, Bainesse, Catterick, for *Bainesse Ramsden King*, red, born Feb. 4; *s. Collynie Lavender King 141709*, d. *Lothian Miss Ramsden* (Vol. 65, p. 1080) by *Milhills Rothes King 138020*.
 688 **R. N.**—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, for *Basildon Roan Rambler*.
 683 (Special, £5.1.)—GEORGE HARRISON, Gainford Hall, Darlington, for *Culloden New Year's Gift*, roan, born Jan. 1, bred by Wm. R. Ross, Culloden, Inverness; *s. Balcalra Duke 153574*, d. *Countess Clara 3rd 11143* by *Beaufort Snow King 140873*.
H. C.—682, 683, 687, 690. **C.**—684, 685.

Class 108.—Shorthorn Bulls, born on or between April 1, 1922, and June 30, 1922.²

- 694 **I. (£15.)**—H. R. H. THE PRINCE OF WALES, K.G., Home Farm, Stoke Newland, Cornwall for *Climdale Dandy Duke*, white, born May 9; *s. Bapton Donsman 153739*, d. *Myrtle's Dandy 2nd* by *Collyole Premier 124847*.
 705 **II. (£10, & Special £10.1.)**—GEORGE HARRISON, Gainford Hall, Darlington, for *Fairfield Favourite*, white, born April 6, bred by D. Collins, Ings House, Skelton, York; *s. Royal Marquis 161789*, d. *Fairfield Broadboks* (Vol. 63, p. 688) by *Crystal Dew 125049*.
 707 **III. (£6.1.)**—JOHN J. MOURRAY, Naemore, Rumbling Bridge, N.B., for *Saltoun Crusader*, roan, born April 3, bred by Capt. A. M. T. Fletcher, Saltoun, East Lothian; *s. Naemore Druid 165542*, d. *Saltoun Crocus 2nd 12849* by *Sanquhar Grand Courier 139193*.
 697 **R. N.**—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for *Swinton Duke Ramsden*.
H. C.—703, 711, 712.

Class 109.—Shorthorn Bulls, born on or between July 1, 1922, and December 31, 1922.²

- 717 **I. (£15.)**—SIR RICHARD COOPER, BT., Billington, Leighton Buzzard, for *Billington Secrecy 2nd*, red, born Sept. 20; *s. Collynie King Lavender 148028*, d. *Sheunstone Secret* (Vol. 64, p. 815) by *Scottie 133446*.
 726 **II. (£10, & Special £5.1.)**—MRS. FRANCES PUMPHREY, Hindley Hall, Stocksfield, for *Hindley Antocrat*, roan, born Aug. 23; *s. Edmore Clipper Star 142212*, d. *Augusta of Greenhead* (Vol. 61, p. 773) by *Edgote Rambler 111684*.
 716 **III. (£5.1.)**—LT.-COL. E. P. BRASSY, Manor Farm, Upper Slaughter, Glos, for *Oliver Jill*, red, born Sept. 3; *s. Balcalra Major 153582*, d. *Slaughter Jill* (Vol. 64, p. 744) by *Moonlight 126984*.
 715 **R. N.**—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for *Swinton Duke Ramsden*.
H. C.—720, 721, 725.

Class 110.—Shorthorn Cows, in-milk, born in or before 1919.

- 736 **I. (£15.)**—J. M. STRICKLAND, Bainesse, Catterick, for *Brandsby's Princess 15th 8028*, roan, born Feb. 4, 1919, calved Oct. 17, 1922; *s. Ardletho Lavender Knight 140489*, d. *Brandsby's Princess* by *Bapton Judge 82768*.
 735 **II. (£10.)**—CAPTAIN J. MACGILLIVRAY, Calroase, Nigg, Ross-shire, for *Lady Laura 8th* (Vol. 65, p. 927), dark roan, born Nov. 6, 1918, calved April 23, 1923, bred by Lord Lovat, Beaufort Castle, Beaulieu; *s. Marlborough 132206*, d. *Lady Laura 3rd* by *Royal Prince Goldie 113184*.
 737 **III. (£5.1.)**—J. H. TOPPIN, Mungrove Hall, Skelton, Penrith, for *Mischief* (Vol. 65, p. 1158), white, born Sept. 27, 1918, calved April 16, 1923; *s. Master Key 137896*, d. *Merric Maid* by *Baron Fitz Rosebud 94181*.
 731 **R. N.**—CAPTAIN A. M. TALBOT FLETCHER, Saltoun Hall, Penciltland, East Lothian, for *Bellona Girl*.
H. C.—729, 734.

¹ Special Prizes of £15 First Prize, and £10 Second Prize, given by the Shorthorn Society for the best groups of three animals bred by Exhibitor in Classes 104-114.

² Prizes given by the Shorthorn Society.

³ Two Special District Prizes given (1.) £10 by the Shorthorn Society, for the best Bull, (II.) £5 by the Northumberland Agricultural Society, for the second best Bull in Classes 107, 108 and 109, the property of Exhibitors residing in Northumberland. A Silver Medal is given by the Shorthorn Society to the Breeder of the animal winning the £10 District Prize.

⁴ Two Special District Prizes given (1.) £10 by the Shorthorn Society, for the best Bull, (II.) £5 by the Durham Agricultural Society, for the second best Bull in Classes 107, 108 and 109, the property of Exhibitors residing in Co. Durham. A Silver Medal is given by the Shorthorn Society to the Breeder of the animal winning the £10 District Prize.

lxxvi *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 111.—Shorthorn Heifers, in-milk, born in 1920.

- 745 I. (£15).—OLIVER W. PORRITT, Hotchley Farm, East Leake, Loughborough, for *Hotchley Countess* 17095, roan, born Sept. 19, calved Dec. 1, 1922; s. *Sanguhar Grand Courtier* 189103, d. *Gipsy Countess* 3rd by *Phingask Comer* 109627.
 739 II. (£10).—MRS. CASS, St. Helens, Ribston, Wetherby, for *Swinton Beauty* 10247, roan, born July 25, calved March 17, 1923, bred by Major Clive Behrens, Swinton Grange, Maltby; s. *Engineer* 120145, d. *Beauty* 11th by *Collingwood* 130284.
 740 III. (£5).—WILLIAM GARRIS, Abington, Palford, Glos, for *Aldsworth Bangle* 19082, roan, born July 31, calved Feb. 5, 1923; s. *Augusta Diamond* 3rd 123964, d. *Ringlet* by *Village Diamond* 100681.
 741 R. N.—JOHN HEATON, Low Startforth Hall, Barnard Castle, for *Naemoor Jealousy* 7th.

Class 112.—Shorthorn Heifers, born in 1921.

- 755 I. (£15, & R. N. for Champion).—GEORGE HARRISON, Gainford Hall, Darlington, for *Gainford Missie* 2nd 24384, white, born Jan. 26; s. *Gainford Premier* 155931, d. *Whitehall Missie* by *Doune Marshal* 130661.
 751 II. (£10).—RICHARD CORNELIUS, Lutwyche Hall, Much Wenlock, Salop, for *Evelyn* 32008, light roan, born Jan. 21, bred by J. Deane Willis, Bapton Manor, Codford; s. *Bapton Golden Crown* 147020, d. *Ermine* by *Hoar Frost* 112077.
 753 III. (£5).—J. A. K. FALCONER, Calmsden Manor, Cirencester, for *Sarcasm* 106th 23660, roan, born Jan. 2; s. *Cluny Clipper Star* 154971, d. *Sarcasm* 79th by *Collynte Knight Goldie* 135823.
 754 IV. (£3).—L. V. GARLAND, Greenbank, The Towns, Hayle, Cornwall, for *Towan Queen* 24164, roan, born Nov. 24; s. *Butterfly Leader* 154520, d. *Beauty Sleep* by *Golden Cloud* 2nd 108751.
 746 R. N.—H.M. THE KING, The Royal Farms, Windsor, for *Windsor Rose* 2nd.
 H. C.—764, 767, 769. C.—768.

Class 113.—Shorthorn Heifers, born on or between January 1, 1922, and March 31, 1922.

- 795 I. (£15).—J. DEANE WILLIS, Bapton Manor, Codford, Wilts, for *Princess Margaret*, roan, born Jan. 5; s. *Billington Snowstorm* 154027, d. *Princess Mary* (Vol. 60, p. 780) by *Musiel Mae* 112632.
 771 II. (£10).—H.R.H. THE PRINCE OF WALES, K.G., Home Farm, Stoke Climsland, Cornwall, for *Climsland Christobelle*, roan, born Jan. 3; s. *Christian King* 147900, d. *Bellona* 10th (Vol. 58, p. 729) by *Gallant Moray* 105567.
 789 III. (£5).—MESSRS. JONES, Dunmore Park, Larchet, N.B., for *Larchet Princess Royal*, white, born Feb. 5; s. *Danglass Victor* 155488, d. *Princess Royal Lily* 4973 by *Edgewoe Royal Chief* 142225.
 778 IV. (£3).—CAPTAIN A. M. TALBOT FLETCHER, Saltoun Hall, Pencalfland, East Lothian, for *Claret Gem* 5th, roan, born Feb. 13, bred by G. Bertram Shields, Dolphinstone, Trant; s. *Double Event* 162830, d. *Claret Gem* (Vol. 65, p. 1094) by *Esmond's Heir* 136435.
 784 R. N.—JOHN HEATON, Low Startforth Hall, Barnard Castle, for *Balthayock Augusta* 32nd.
 H. C.—772, 786. C.—774, 780, 785.

Class 114.—Shorthorn Heifers, born on or between April 1, 1922, and December 31, 1922.

- 807 I. (£15, Champion, & R. N. for Champion).—ARTHUR GREEN, Denton, Ben Rhydding, Leeds, for *Denton Betty*, roan, born April 12; s. *Collynie Lavender King* 141700, d. *Alfreda Queen* (Vol. 62, p. 813) by *Rambler* 122235.
 797 II. (£10).—H.M. THE KING, The Royal Farms, Windsor, for *Windsor Rose* 3rd, red and little white, born April 2; s. *Edgewoe Flatterer* 125374, d. *Windsor Rose* 12 by *Rubicon* 145191.
 806 III. (£5).—L. V. GARLAND, Greenbank, The Towns, Hayle, Cornwall, for *Towan Fairy Queen*, white, born April 29; s. *Climsland Cavalier* 162225, d. *Hayle Evening Star* 14353 by *Flight of Uta* 142410.
 798 IV. (£3).—H.R.H. THE PRINCE OF WALES, K.G., Home Farm, Stoke Climsland, Cornwall, for *Climsland Pauline* 3rd, roan, born April 5; s. *Climsland Grenadier* 154818, d. *Climsland Pauline* 2nd (Vol. 64, p. 670) by *Butterfly Knight* 130029.
 814 R. N.—JOHN J. MURRAY, Naemoor, Rumbling Bridge, N.B., for *Naemoor Rothes Queen*.
 H. C.—803. C.—805.

¹ Champion Prize of £20 given by the Shorthorn Society, for the best Cow or Heifer in Classes 110-114. A Silver Medal is given by the Shorthorn Society to the Breeder of the Champion Cow or Heifer.

² The "Brothers Colling" Memorial Perpetual Challenge Cup, value 100 Guineas, given through the Durham Agricultural Committee for the best Shorthorn in Classes 104-114.

Dairy Shorthorns.

Class 115.—Dairy Shorthorn Bulls, born in or before 1920.

- 822 I. (£15, & Champion.)—THE EARL OF BESSBOROUGH, Bessborough, Piltown, Co. Kil-kenny, for Bessborough Polonius 140059, roan, born Nov. 10, 1917; s. Bessborough Nestor 135121, d. Bessborough Blonde 15th by Keir Goldfinger 99249.
 827 II. (£10.)—T. L. MARTIN, Aslie Warren House, Overton, Hants, for Kelmscott Conjuror 28th 136774, roan, born July 7, 1919, bred by R. W. Hobbs & Sons, Kelmscott, Lechlade; s. Kelmscott Acrobat 4th 126217, d. Sybil 18th by Royal Pretor 110029.
 830 III. (£5.)—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for Baron's Pride 153524, roan, born Nov. 24, 1919; s. Rockley Baronet 144978, d. Rockley Harrington by Oxford Count 106352.
 829 R. N.—T. E. CLARKE, Chalfan Hall, Silverdale, Lancs, for Leek Rosemary's Heir.
 836, 910, 932 (Cup.)—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., for Baron's Pride, Lily Charter 2nd and Red Rose 7th.
 H. C.—824, 825.

Class 116.—Dairy Shorthorn Bulls, born in 1921.

- 835 I. (£15.)—MAJOR R. W. CROPER, M.C., Rush Court, Wallingford, for Colescombe Dolphin 2nd 170434, roan, born June 12, bred by W. G. Millar, Bampton, Oxon; s. Knowsley Dolphin 137428, d. Laurestina of Hulton 8th by Pearl Emperor 116909.
 838 II. (£10.)—CAPTAIN THE HON. E. A. FRIZROY, M.P., Fox Hill, West Haddon, Rugby, for Foxhill Cary 171702, roan, born Sept. 22; s. John Wild Eyes 149616, d. Clifford Lady Carl by Knight 131802.
 837 III. (£5.)—E. EZRA, Lock, Partridge Green, Sussex, for Lock Dairyman 173525, white, born May 12; s. Proud Victor 151279, d. Lucy Welcome by Dairyman 130512.
 842 R. N.—RUSTACE ABEL SMITH, Longhills, Lincoln, for Longhills Musician.
 H. C.—832, 838, 840, 844. C.—834, 845.

Class 117.—Dairy Shorthorn Bulls, born on or between January 1, 1922, and March 31, 1922.³

- 856 I. (£15, & R. N. for Champion.)—SIR GILBERT A. H. WILLS, Bt., Batford Park, Moreton-in-Marsh, for Batford Remus, roan, born March 21; s. Thornby Lord Foggathorpe 167521, d. Cotswold Ursula 654 by Romulus 128052.
 853 II. (£10.)—J. M. STRICKLAND, Bainesse, Catterick, for Bainesse Lord Broadhocks, dark roan, born Feb. 8; s. Carries King 161988, d. Brandsby's Lady Broadhocks 6th (Vol. 65, p. 1130) by Welcome Guest 140083.
 855 III. (£5.)—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for Eaton Stirling Prince, red, born Jan. 19; s. Cherry Ben 147869, d. Nelly Princess (Vol. 59, p. 660) by Stirling Prince 110280.
 854 R. N.—J. M. STRICKLAND, for Bainesse Lord Broadhocks 2nd.

Class 118.—Dairy Shorthorn Bulls, born on or between April 1, 1922, and June 30, 1922.³

- 870 I. (£15.)—ALFRED PALMER, Wokefield Park, Mortimer, Berks, for Kelmscott Conjuror 60th, red and little white, born May 25, bred by E. W. Hobbs & Sons, Kelmscott, Lechlade; s. Kelmscott Acrobat 4th 126217, d. Hawthorn 9th (Vol. 59, p. 754) by Royal Hampton 06008.
 869 II. (£10.)—J. PIERMONT MORGAN, Wall Hall, Aldenham, Herts, for Aldenham Matchless Joe, red and little white, born May 31; s. Cantab Jocelyn's Armistice 147744, d. Newlands Daisy 6th (Vol. 66, p. 1009) by Mayflower Boy 116349.
 873 III. (£5.)—RUSTACE ABEL SMITH, Longhills, Lincoln, for Longhills Lord Charlie, red and little white, born June 13; s. Abraham Lord Price 140574, d. Longhills Carrie (Vol. 65, p. 1194) by Oxford Bridegroom 121914.
 879 R. N.—CAPTAIN ARNOLD S. WILLS, Thornby Hall, Northampton, for Thornby Royal Cran.
 879, 913, 934 (R. N. for Cup.)—CAPTAIN ARNOLD S. WILLS, for Thornby Royal Cran, Thornby Foggathorpe 2nd and Thornby Foggathorpe 7th.
 H.C.—860, 877.

¹ Champion Prize of £10 given by the Dairy Shorthorn Association, for the best Bull in Classes 115-119.

² Silver Challenge Cup, value 100 Guineas, given through the Dairy Shorthorn Association, for the best group of one Bull and two Cows or Heifers in Classes 115-123. Two at least of the animals must have been bred by the Exhibitor.

³ Prizes given by the Dairy Shorthorn Association.

lxxviii *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 119.—Dairy Shorthorn Bulls, born on or between July 1, 1922, and December 31, 1922.

- 892 I. (#15).—ROBERT N. TONY, Anderson, Blandford, for *Anderson Conjuror* 9th, dark roan, born Oct. 4; s. *Kelmscott Conjuror* 3rd 137269, d. *Bianca Blanche* 11th (Vol. 64, p. 1374) by *Billag Rajah* 124320.
 887 II. (#10).—FRED T. FISHER, Pinkneys Court, Maldenhead, for *Pinkneys Darlington Major*, red roan, born July 30; s. *Tockham Keystone* 2nd 162805, d. *Yeldersley Darlington* 6th (Vol. 64, p. 1404) by *Darlington Minor* 110987.
 891 III. (#5).—EUSTACE ABRAHAM SMITH, Longhills, Lincoln, for *Longhills Minstrel*, roan, born Sept. 17; s. *Abraham Lord Price* 140674, d. *Longhills Melody* (Vol. 65, p. 1105) by *Kelmscott Acrobat* 9th 131800.
 882 R. N.—JOHN BRITTON, Boxeat Manor, Wellingborough, for *Champion Duke*.
 H. C.—885, 888.

Class 120.—Dairy Shorthorn Cows, in-milk, born in or before 1916.¹

- 910 I. (#15, & Champion).—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for *Lily Charter* 2nd (Vol. 65, p. 1228), light roan, born March 28, 1916, calved June 3, 1923, bred by F. Bird, Tern Bank, Neston, Cheshire; s. *Thorneycroft Richard* 129497, d. *Lily Charter* by *Royal Charter* 89910.
 912 II. (#10).—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., for *Rosy* (Vol. 62, p. 654), roan, born June 17, 1915, calved June 9, 1923, bred by N. Burton, Chesterton Green, Harbury, Leamington; s. *Dick Barrington* 119886, d. *Rosamond's Fortune* by *Rock of Fortune* 100390.
 913 III. (#5).—CAPTAIN ARNOLD S. WILLS, Thornby Hall, Northampton, for *Thornby Foggathorpe* 2nd (Vol. 61, p. 1114), white, born Sept. 11, 1914, calved June 2, 1923; s. *Dreadnought* 102048, d. *Dolphinlee Foggathorpe* 3rd by *Lancaster Victor* 99312.
 899 R. N.—CAPTAIN THE HON. E. A. FITZROY, M.P., Fox Hill, West Haddon, Rugby, for *Carlton Queen* 7th.
 910, 932, 933 (Cup).—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., for *Lily Charter* 2nd, *Red Rose* 7th and *White Heather*.
 912, 951, 977 (R. N. for Cup).—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., for *Rosy*, *Eaton Seraphine* and *Queen of the West*.
 H. C.—898, 908, 914. C.—904.

Class 121.—Dairy Shorthorn Cows, in-milk, born in 1917 or 1918.¹

- 934 I. (#15, & R. N. for Champion).—CAPTAIN ARNOLD S. WILLS, Thornby Hall, Northampton, for *Thornby Foggathorpe* 7th (Vol. 64, p. 1391), white, born June 3, 1917, calved June 5, 1923; s. *Darius* 113142, d. *Thornby Foggathorpe* 2nd by *Dreadnought* 102048.
 933 II. (#10).—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for *White Heather* 27054, white, born Jan. 7, 1917, calved June 9, 1923, bred by T. Gowing, Hunningham Hall, Leamington Spa; s. *Winning Gift* 134390, d. *Bellaport Dewdrop* 746 by *Notlaw Leo* 116801.
 932 III. (#5).—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., for *Red Rose* 7th (Vol. 65, p. 1186), red, born Feb. 28, 1918, calved June 22, 1923; s. *Leek Conjuror* 121142, d. *Red Rose* 6th by *Wellborn* 107459.
 920 R. N.—G. P. GOLDEN, Eaglesfield, Teire, Rugby, for *Lady Ivanhoe*.
 H. C.—917, 924, 926.

Class 122.—Dairy Shorthorn Cows, in-milk, born in 1919.

- 942 I. (#15).—LT.-COL. R. MOSTYN-OWEN, D.S.O., Woodhouse, Oswestry, for *Rosella Prim* 4th 8217, red and little white, born Feb. 17, calved May 25, 1923, bred by W. Taylor, Syke Side, Souby; s. *Royal Stockman*, 145183, d. *Rosetta Prim* by *Marmion Robin* 112446.
 951 II. (#10).—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for *Eaton Seraphine* 8989, red, born Jan. 3, calved June 13, 1923; s. *Dairy Benedict* 136045, d. *Longton Seraphine* 2nd by *Longton Count* 169008.
 946 III. (#5).—CRAWFORD R. L. PERKINS, Hepscott Manor, Morpeth, for *Arvidor Cyrene* 2710, roan, born Feb. 5, calved June 6, 1923, bred by B. C. Fairweather, Avisford Park, Arundel; s. *Apley Record Rosador* 134633, d. *Idilcote Cyrene* 2nd by *Idilcote* 102573.
 943 R. N.—HERBERT H. OWTRAM, Newland Hall, Lancaster, for *Newland Poppy* 38th.

¹ Prizes given by the Shorthorn Society.

² Champion Prize of £10 given by the Shorthorn Society, for the best Cow or Heifer in Classes 120-123. A Silver Medal is given by the Shorthorn Society to the Breeder of the Champion Dairy Shorthorn Cow.

³ Silver Challenge Cup, value Fifty Guineas, given through the Dairy Shorthorn Association for the best group of three Cows or Heifers in Classes 120-123.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. lxxix

Class 123.—Dairy Shorthorn Heifers, in-milk, born in 1920.

- 980 I. (215).—MAJOR S. P. YATES, Broughton Grange, Banbury, for *Sorbrook Foggathorpe* 20122, red and little white, born May 15, calved April 28, 1923; *s.* *Presbute Barrington* 144502, *d.* *Loobagh Foggathorpe* 5th by *Loobagh Duke* 126555.
 989 II. (210).—HERBERT H. OWYRAM, Newland Hall, Lancaster, for *Newland Rose* 20th 16089, white, born June 22, calved June 11, 1923; *s.* *Cockerham Buttons* 148013, *d.* *Newland Rose* 16th by *Mayflower Boy* 116518.
 994 III. (25).—JOHN BRITTEN, Bozeat Manor, Wellingborough, for *Champion Duchess* 10655, white, born July 15, calved June 18, 1923; *s.* *Loobagh Beau* 3rd 143635, *d.* *Duchess of Cumberland* 16th (Vol. 34, p. 789) by *Royal Emperor Oxford* 13th 82156.
 977 R. N.—THE DUKE OF WESTMINSTER, O.C.V.O., D.S.O., Eaton Hall, Chester, for *Queen of the West*.

Non-Pedigree Dairy Shorthorns.

Class 124.—Non-Pedigree Dairy Shorthorn Cows, in-milk, born in or before 1917.

- 988 I. (215).—BELGIAN BREEDING STOCK FARMS, LTD., Thorpe Satchville, Melton Mowbray, for *Thompson*, roan, born April 10, 1917, calved June 21, 1923, bred by J. Anison, Tower Head, Skelton, Penrith.
 982 II. (210).—CHARLES J. BEECHENER, Green Farm, Barton-in-the-Cley, Amptill, for *Fuldo Queen*, roan, born Aug. 29, 1917, calved June 17, 1923.
 981 III. (25).—JAMES BATTIE & SONS, Hoe Fields, Thurlaston, Hincley, for *Stella*, roan, age and breeder unknown, calved June 8, 1923.

Class 125.—Non-Pedigree Dairy Shorthorn Cows or Heifers, in-milk, born in or after 1918.¹

- 994 I. (215).—J. PIERPONT MORGAN, Wall Hall, Aldenhall, Herts, for *Empress* 8th D.S.A. 1614, roan, born March 10, 1919, calved May 10, 1923, bred by J. Almond, Buckley Hill Farm, Sefton, Liverpool; *s.* *Hawkrigg Prince* 136902, *d.* *Empress* (D.S.A. 149).

Lincolnshire Red Shorthorns.

Class 126.—Lincolnshire Red Shorthorn Bulls, born in or before 1920.

- 988 I. (215, & R. N. for Champion).—W. A. HARRISON, The North Lodge, Grantham, for *Hawkiotianian Premier* 14005, born Jan. 3, 1918, bred by E. P. Turtin, Horkstow, Hull; *s.* *Welbourne Victorious* 12145, *d.* *Horkstowian Maiden* by *Marshall* 7th 9193.
 987 II. (210).—MAJOR H. COOPER, Flawborough, Orston, Notts, for *Soignee Fadhia* 14879, born Dec. 22, 1918, bred by A. Lewis, Westacre, Norfolk; *s.* *Elkington Hercules* 3rd 13432, *d.* *Soignee* No. 80.
 985 III. (25).—ROBERT CHATTERTON, Welbourn Hall, Lincoln, for *Fairman* 13443, born June 26, 1916, bred by J. C. Mountain, Welbourn; *s.* *Culceby Freemason* 8869, *d.* *Welbourne Lady Turnill* by *Welbourne Mary* 8008.
 993 R. N.—LT.-COL. SIR A. G. WEIGALL, K.C.M.G., Petwood, Woodhall Spa, for *Kirmington Ruby King* 63rd.
 H. C.—996. C.—990.

Class 127.—Lincolnshire Red Shorthorn Bulls, born in 1921.

- 999 I. (215, & Champion).—BUTLER SMITH, The Fields, Cropwell Butler, Nottingham, for *Harlaston Balancer* 14603, born April 4, bred by W. A. Harrison, North Lodge, Harlaston, Grantham; *s.* *Horkstowian Premier* 14005, *d.* *Harlaston Deeping Pride* by *Deeping Curly Coat* 2nd 10629.
 1000 II. (210).—LT.-COL. SIR A. G. WEIGALL, K.C.M.G., Petwood, Woodhall Spa, for *Kirmington Normanby* 17717, born April 6, bred by George Morris, Kirmington, Leicestershire; *s.* *Ballington Ascent* 15487, *d.* *Normanby Salome* 2nd by *Scampton Majestic* 8513.
 996 III. (25).—A. PRESTON JONES, Mickleover House, Derby, for *Mickleover Totill Royal* 2nd, born May 10, bred by G. R. Needham, Moul House, Blisby, Lincoln; *s.* *Pendley Record* 13746, *d.* *Totill Deesby* (Vol. 26, p. 388) by *Beeby Nonsuch* 2nd 15171.
 997 R. N.—A. PRESTON JONES, for *Mickleover Totill Thoresby* 3rd.
 H. C.—894.

¹ Prizes given by the Dairy Shorthorn Association.

² Champion Silver Cup value £10 given by the Lincolnshire Red Shorthorn Association for the best Bull in Classes 126-128.

lxxx *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 128.—Lincolnshire Red Shorthorn Bulls, born in 1922.¹

- 1001 I. (215).—CHARLES BEMBRIDGE, Walcott, Lincoln, for *Anwick Champion*, born Oct. 18; *s.* Scampton Vind 16896, *d.* Anwick Pink (Vol. 23, p. 281) by Anwick Bumper 10427.
 1004 II. (210).—MISSES E. M. & S. M. GRANTHAM, The Rookery, West Keal, Spilsby, for *Keal Confidence*, born April 10; *s.* Pendley Harold 14757, *d.* Keal Cherry 28th (Vol. 20, p. 344) by Hlsby Showman 2nd 11374.
 1003 III. (25).—GEOFFREY COLEMAN, Wood Walton, Peterborough, for *Wood Walton Bombadier* 2nd 18218, born Jan. 8; *s.* Horkstowainian Onyx 13566, *d.* Wood Walton Dorothy by Kelsey Hermit 10819.

Class 129.—Lincolnshire Red Shorthorn Cows or Heifers, in-milk, born in or before 1920.

- 1008 I. (215, & Champion*).—MAJOR H. COOPER, Flawborough, Orston, Notts, for *Flawborough Perfection* (Vol. 26, p. 327), born July 14, 1919, calved April 11, 1923; *s.* Flawborough Chieftain 12518, *d.* Flawborough Sunspot by Rising Star 7839.
 1007 II. (210).—MAJOR H. COOPER, for *Flawborough Nancy* (Vol. 26, p. 326), born July 11, 1918, calved April 19, 1923; *s.* Flawborough Chieftain 12518, *d.* Flawborough Priceless by High Tointon Coronation 8332.
 1017 III. (25).—LT.-COL. SIR A. G. WEIGALL, K.C.M.G., Petwood, Woodhall Spa, for *Retford Nancy* 2nd (Vol. 25, p. 303), born May 14, 1918, calved March 20, 1923, bred by Arthur Barber, Grove Grange, Retford; *s.* Otby Comet 9th 11818, *d.* Retford Nancy 2nd by Marshman 2nd 7755.
 1012 R. N.—A. PRESTON JONES, Mickleover House, Derby, for *Tealby No. 359*.
 H. C.—1016. C.—1014.

Class 130.—Lincolnshire Red Shorthorn Cows or Heifers, in-milk, born in or before 1920, showing the best milking properties.²

- 1020 I. (215, & R. N. for Champion*).—LT.-COL. SIR A. G. WEIGALL, K.C.M.G., Petwood, Woodhall Spa, for *Petwood Ella* (Vol. 24, p. 448), born April 13, 1917, calved May 6, 1923; *s.* Petwood Dragon 11334, *d.* Scamblesby Ella by Dunstby Red 6th 7542.
 1024 II. (210).—JOHN EVENS & SON, Burton, Lincoln, for *Burton Diligent* (Vol. 26, p. 331), born in Oct., 1917, calved June 3, 1923, bred by C. J. C. Hill, Eisham; *s.* Otby Alfred 10th 16745, *d.* Diligent by Bonby Tourist 12th 6646.
 1021 III. (25).—J. O. BURCHALL, The Manor House, Aston Flamville, Hincley, for *Flamville Dairymaid* 127th (Vol. 26, p. 315), born Feb. 28, 1917, calved June 20, 1923; *s.* Worlaby No. 68 10402, *d.* by Norton Ruby 8232.
 1022 R. N.—J. O. BURCHALL, for *Flamville Dairymaid* 140th.
 H. C.—1020, 1032. C.—1025.

Class 131.—Lincolnshire Red Shorthorn Heifers, born in 1921.

- 1034 I. (215).—MAJOR H. COOPER, Flawborough, Orston, Notts, for *Flawborough Curly* (Vol. 23, p. 344), born July 14; *s.* Tealby No. 167 14953, *d.* Stowo Curly Coat 3rd by Burton Comet 2nd 6662.
 1039 II. (210).—LT.-COL. SIR A. G. WEIGALL, K.C.M.G., Petwood, Woodhall Spa, for *Petwood Tully* 6th (Vol. 23, p. 370), born Oct. 9; *s.* Kirmington Ruby King 63rd 15598, *d.* Petwood Tully 1st by Scampton Marquis 8514.
 1038 III. (25).—A. PRESTON JONES, Mickleover House, Derby, for *Mickleover Primula*, born Aug. 8; *s.* Beacon Hill Calro 15165, *d.* Flawborough Pansy (Vol. 27, p. 567) by Flawborough Marvel 9869.
 1036 R. N.—MISSSES E. M. & S. M. GRANTHAM, The Rookery, West Keal, Spilsby, for *Keal Cherry* 3rd.
 H. C.—1035.

Class 132.—Lincolnshire Red Shorthorn Heifers, born in 1922.¹

- 1042 I. (215).—W. A. HARRISON, The North Lodge, Grantham, for *Harlaxton Charm*, born March 16; *s.* Cockerington Anderby 16282, *d.* Harlaxton, Scampton Pink (Vol. 22, p. 376) by Scampton Judge 6327.
 1040 II. (210).—H. M. THE KING, Sandringham, Norfolk, for *Wolterton Beauty*, born Jan. 30; *s.* Scampton Quality 11912, *d.* Thurlaston Beauty (Vol. 26, p. 272) by Pendley Result 13748.
 1046 III. (25).—LT.-COL. SIR A. G. WEIGALL, K.C.M.G., Petwood, Woodhall Spa, for *Grainthorpe Clara* 9th, born March 28, bred by Col. H. T. Fenwick, C.M.G., D.S.O., Sea Farm, Grainthorpe, Louth; *s.* Cockerington Favourite 16285, *d.* Grainthorpe Clara 2nd (Vol. 24, p. 346) by Scampton Marquis 8514.
 1045 R. N.—OLIVER W. PORRITT, Helmschore, Manchester, for *Musbury Betty*.
 H. C.—1043.

¹ Prizes given by the Lincolnshire Red Shorthorn Association.

* Champion Silver Cup value £10 given by the Lincolnshire Red Shorthorn Association for the best Cow or Heifer in Classes 129-132.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. lxxxii

Herefords.

Class 133.—Hereford Bulls, born in or before 1920.

- 1052 I. (£15, Champion.¹ & Champion.²)—E. CRAIG TANNER, Eytton-on-Severn, Cross Houses, Salop, for *Leon* 32709, born Jan. 5, bred by G. H. Bray, Darnlington Court, Hereford; *s. Broadheath Maxim* 28953, *d. Leintshall Beauty* 2nd by Marcellus 23553.
 1050 II. (£10.)—KENNETH W. MILNES, The Field, Hereford, for *Larder* 37146, born Jan. 7, 1919; *s. Hermit* 32602, *d. Neckchain* by Sir James 26489.
 1048 III. (£5.)—HENRY R. FRANK, Court of Noke, Pembridge, for *Charles* 2nd 36303, born Jan. 26, 1910, bred by Major R. L. Heygate, The Wells, Bromyard; *s. Pretender* 31846, *d. Seabird* by Mariner 28468.
 1047 R. N.—W. G. BUCHANAN, Manor House Farm, Abergavenny, for *Ankerdina* Cooanant. H. C.—1051.

Class 134.—Hereford Bulls, born in 1921.

- 1057 I. (£15, R. N. for Champion.¹ & R. N. for Champion.²)—CHARLES H. MORRIS, Weston Court, Pembridge, for *Weston Gamester* 41704, born Jan. 12; *s. Crossways Gamester* Sam 38930, *d. Pearl* by Hardwick Regent 31573.
 1060 II. (£10.)—W. SMITH, The Leen, Pembridge, for *Free Town Warrior* 40071, born Feb. 20, bred by P. E. Bradstock, Free Town, Hereford; *s. Aldersend Napier* 35844, *d. Golden Treasure* by Laureate 11th 33862.
 1053 III. (£5.)—DAVID P. BARNETT, Danygraig, Newton, Porthcawl, for *Apsam* 40433, born April 24; *s. Walterston Sam* 38300, *d. Shelsley Lucy* by Eaton Sovereign 26832.
 1058 R. N.—T. MORGAN EDWARDS, Birches, Tenbury Wells, for *Birch Resolute*. H. C.—1056. C.—1054.

Class 135.—Hereford Bulls, born in January or February, 1922.³

- 1070 I. (£15.)—SYDNEY PYMAN, Pigeon House, Ross-on-Wye, Herefordshire, for *Windsor Star*, born Jan. 13, bred by His Majesty the King, Windsor; *s. Lintley Statesman* 37327, *d. Simplicity* (Vol. 52, p. 189) by Conway 32393.
 1067 II. (£10.)—CAPTAIN R. T. HINCKES, Mansel Court, Hereford, for *Farmington Monk* 42393, born Feb. 12, bred by Lt.-Col. C. J. BARTON, Farmington Lodge, Northleach, Glos.; *s. Farmington Noble* 39153, *d. Maria* by Monktonian 28500.
 1068 III. (£5.)—CAPTAIN R. T. HINCKES, for *Mansel Rosebird* 42577, born Jan. 6; *s. Aldersend Clemak* 35833, *d. Mansel Rose* by Starlight 28754.
 1062 R. N.—HENRY J. DENT, Perton Court, Stoke Edith, Hereford, for *Perton Elect*. H. C.—1063.

Class 136.—Hereford Bulls, born in 1922 on or after March 1.³

- 1073 I. (£15.)—W. H. WASS, Gattertop, Leominster, for *Gattertop Prince*, born March 11; *s. Salacious* 30939, *d. Tilda* (Vol. 48, p. 930) by Simcad 28762.
 1074 II. (£10.)—H. WESTON & SONS, The Hounds, Much Marcle, Herefordshire, for *Bounds Model*, born March 2; *s. Conquest* 32383, *d. Dorothy* (Vol. 50, p. 990) by Bounds Briton 28914.

Class 137.—Hereford Cows or Heifers, in-milk, born in or before 1920.

- 1080 I. (£15, & R. N. for Champion.⁴)—E. CRAIG TANNER, Eytton-on-Severn, Cross Houses, Salop, for *Duchess* 2nd (Vol. 49, p. 857), born Feb. 3, 1917, calved Oct. 14, 1922; *s. Shradon Frederick* 33113, *d. Duchess* by Curlew 27476.
 1077 II. (£10.)—THE EARL OF COVENTRY, Croome Court, Worcester, for *Garnet* (Vol. 50, p. 433), born Feb. 13, 1916, calved March 30, 1923; *s. Dollymount* 27309, *d. Garland* by Ivington Bright 28360.
 1076 III. (£5.)—THE EARL OF COVENTRY, for *Gardenia* (Vol. 50, p. 426), born Jan. 17, 1917, calved March 20, 1923; *s. Dollar* 30407, *d. Garter* by Maxwell 24155.
 1075 R. N.—DAVID P. BARNETT, Danygraig, Newton, Porthcawl, for *Lucy*. H. C.—1078.

Class 138.—Hereford Heifers, born in 1921.

- 1081 I. (£15, & Champion.⁴)—H. M. THE KING, The Royal Farms, Windsor, for *Clairvoyant Jewel* (Vol. 52, p. 188), born Feb. 11; *s. Paymaster* 32392, *d. Clairvoyant* by Rougemont 52306.
 1083 II. (£10.)—DAVID P. BARNETT, Danygraig, Newton, Porthcawl, for *Snowdrop* (Vol. 52, p. 199), born Jan. 22; *s. Walterston Sam* 38300, *d. Dolesome* by Sir Sam 33131.
 1082 III. (£5.)—H. M. THE KING, for *Simplicity* 2nd (Vol. 52, p. 189), born Jan. 1; *s. Twyford Triumph* 35704, *d. Simplicity* by Conway 32393.

¹ Champion Prize of £10 10s. given by the Hereford Herd Book Society, for the best Bull in Classes 133-138.

² Perpetual Silver Challenge Trophy, value 100 Guineas, given through the Hereford Herd Book Society, for the best Bull in Classes 133-138.

³ Prizes given by the Hereford Herd Book Society.

⁴ Champion Prize of £10 10s. given by the Hereford Herd Book Society for the best Cow or Heifer in Classes 137-138.

lxxxii *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 139.—Hereford Heifers, born in 1922.

- 1093 I. (£15).—STEWART ROBINSON, The Ovals, Kington, Herefordshire, for *Water Lily*, born Jan. 21; *s.* Discovery 30015, *d.* Lillian 23rd (Vol. 50, p. 830) by One Royal 32571.
 1098 II. (£10).—GEORGE H. DRUMMOND, Pitsford Hall, Northampton, for *Songstress of Pitsford 2nd*, born Feb. 20; *s.* Sir Sam 33131, *d.* Songstress (Vol. 51, p. 359) by Eaton Royalist 31446.
 1095 III. (£5).—H. WESTON & SONS, The Bounds, Much Marcle, Herefordshire, for *Merry Maid 3rd*, born Jan. 12; *s.* Bounds Justice 36106, *d.* Merry Maid (Vol. 50, p. 994) by Bounds Democrat 30396.
 1095 R. N.—GEORGE H. DRUMMOND, for *Cherry of Pitsford 2nd*.
 H. C.—1087, 1092. C.—1088, 1089, 1091.

Devons.

Class 140.—Devon Bulls, born in or before 1921.

- 1098 I. (£15, & Champion).—A. M. WILLIAMS, Werrington Park, Launceston, for *Roadwater Goldfinder 10738*, born Nov. 28, 1918, bred by A. J. Hill, Roadwater, Washford, Taunton; *s.* Lovely's Duke 6th 8965, *d.* Goldenup 78th 28411 by Lovely's Duke 5th 8573.
 1096 II. (£10).—HARRY O. DAINFABE, Redlands, Lulworth, Cambridge, for *Lulworth Mountaineer 11104*, born Jan. 30, 1920; *s.* Lulworth Royal 10172, *d.* Hill Berry 27412 by St. Andries Wellington 7858.
 1097 III. (£5).—CHARLES MORRIS, Highfield Hall, St. Albans and Bishop's Lydeard, Somerset, for *Highfield Victor 3rd 11530*, born Jan. 1, 1921; *s.* Pixford Giant 10258, *d.* Highfield Countess 3rd 26058 by Pound Lord Brassy 5th 5622.

Class 141.—Devon Bulls, born in 1922.

- 1101 I. (£15, & R. N. for Champion).—CHARLES MORRIS, Highfield Hall, St. Albans and Bishop's Lydeard, Somerset, for *Highfield Nobleman*, born Jan. 29; *s.* Highfield Gem 2nd 6029, *d.* Northmoor Clay 2nd 8245 by Gelson Prince 2nd 8070.
 1100 II. (£10).—ELAND CLATWORTHY, Cutsey Trull, Taunton, for *Cutsey Larkspur*, born March 28; *s.* Pound Paragon 10235, *d.* Goldfinder's Lovely 5th 27095 by Stockleigh Goldfinder 7268.
 1099 III. (£5).—ROBERT BRUFORD, M.P., Nerrols, Taunton, for *Nerrols Advance*, born March 7; *s.* Highfield Advance 9318, *d.* Nerrols Apricot 24578 by Stockleigh Top Sawyer 6549.
 1103 R. N.—A. M. WILLIAMS, Werrington Park, Launceston, for *Werrington Salsr*.
 H. C.—1102.

Class 142.—Devon Cows or Heifers, in-milk, born in or before 1920.

- 1105 I. (£15, & Champion).—CHARLES MORRIS, Highfield Hall, St. Albans, and Bishop's Lydeard, for *Highfield Farthing 8th 39398*, born Dec. 26, 1916, calved Dec. 29, 1922; *s.* Highfield General 8103, *d.* Highfield Farthing 5th 26925 by Capton Bellringer 4911.
 1104 II. (£10).—CHARLES MORRIS, for *Highfield Comely 27754*, born Feb. 12, 1914, calved June 5, 1923; *s.* Holcombe Reminder 7413, *d.* Cotelstone Comely 23501 by Rufus 5370.

Class 143.—Devon Heifers, born in 1921.

- 1109 I. (£15).—ELAND CLATWORTHY, Cutsey Trull, Taunton, for *Cutsey Betsey 33818*, born March 12; *s.* Overton Favourite 9797, *d.* Young Betsey 33825 by Holcombe Major 7412.
 1109 II. (£10).—CHARLES MORRIS, Highfield Hall, St. Albans, and Bishop's Lydeard, Somerset, for *Highfield Cherry 34204*, born Feb. 10; *s.* Crazelowman Beechnut 9620, *d.* Northmoor Cherry 31554 by Gelson Prince 2nd 8070.
 1107 III. (£5).—H. M. THE KING, The Royal Falcon, Windsor, for *Windsor Grass 32406*, born Jan. 31; *s.* Windsor Captain 8325, *d.* Cotelstone Care 25034 by General Buller 4592.
 1110 R. N.—CHARLES MORRIS, for *Highfield China Cup 13th*.

Class 144.—Devon Heifers, born in 1922.

- 1111 I. (£15, & R. N. for Champion).—ROBERT BRUFORD, M.P., Nerrols, Taunton, for *Nerrols Hawthorn 5th*, born Jan. 4; *s.* Highfield Advance 9318, *d.* Nerrols Hawthorn 28991 by Beauty's Tip Top 46074.
 1112 II. (£10).—ROBERT BRUFORD, M.P., for *Nerrols Hawthorn 6th*, born Jan. 15; *s.* Highfield Advance 9318, *d.* Nerrols Hawthorn 3rd 30766 by Highfield Chieftain 8915.
 1115 III. (£5).—A. M. WILLIAMS, Werrington Park, Launceston, for *Ethel 6th*, born July 10; *s.* Roadwater Goldfinder 10738, *d.* Ethel 4th C. 752 by Conquest 8414.
 1113 R. N.—CHARLES MORRIS, Highfield Hall, St. Albans, and Bishop's Lydeard, for *Highfield Bluebell 2nd*.

¹ Champion Prize of £10 10s. given by the Devon Cattle Breeders' Society for the best Bull in Classes 140 and 141.

² Champion Prize of £10 10s. given by the Devon Cattle Breeders' Society for the best Cow or Heifer in Classes 142-144.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. lxxxiii

South Devons.

Class 145.—*South Devon Bulls, born in or before 1921.*

- 1116 I. (215.)—CAPTAIN J. T. COATYOT, Pentille Castle, St. Mellion, for *Mothcombe Milkman* 7245, born Jan. 29, 1917, bred by J. M. Wroth, Coombe, Holbeton, Plymouth; s. *Brownstone Laddle* 4774, d. *Kitty* 11348 by *Merafield Paymaster* 3491.
 1117 II. (210.)—THOMAS EVENS, Ramsland, Yealinton, Devon, for *Ramsland Champion* 3014, born June 1, 1918, bred by M. Evans & Son, Ramsland; s. *Lilian's Champion* 6016, d. *Fiddle* 3rd 10538 by *Merafield Marquis* 2685.
 1119 III. (25.)—F. VIGGERS & SONS, Woodford Farm, Plympton, Devon, for *Prawle Rent-payer* 9388, born Jan. 7, 1920, bred by L. A. Oldrieve, West Prawle, Salcombe; s. *Bowden Strawberry Boy* 6988A, d. *Dahila* 13596 by *Marvel* of Fern 4094.

Class 146.—*South Devon Bulls, born in 1922.*

- 1122 I. (215.)—JAMES C. P. HARVEY, Pamflete, Holbeton, Devon, for *Pamflete Silver King*, born March 1; s. *Coleridge Napoleon* 10th 7644, d. *Dowhorn* 3rd 13202 by *Caulston Rival* 5945.
 1121 II. (210.)—GEORGE FURNEAUX, Treeby, Yealinton, Devon, for *Treeby Boy*, born March 14, bred by J. Reddecliffe & Sons, Southbrook, Bovey Tracey; s. *Felham* 1st 5927, d. *Primrose* 10093 by *Southbrook Champion* 3905.
 1124 III. (25.)—W. L. HOSKING & SONS, Pentougollan, Merther, Probus, for *Pentougollan Ussell*, born May 14; s. *Antony Milkman* 8261, d. *Pentougollan Dora* 2nd 19899 by *Stretchford Masterpiece* 8793.
 1120 R. N.—JOHN COAKER & SON, Wear, Bishopsteignton, Telfmouth, for *Antony Prince George*.
 H. C.—1123.

Class 147.—*South Devon Cows or Heifers, in-milk, born in or before 1920.*

- 1127 I. (215.)—HENRY CHAFFE, Herestone, Brixton, Devon, for *Worswell Gladys* 11th 21096, born July 2, 1919, calved Jan. 14, 1923; s. *Widland Champion* 6874, d. *Worswell Gladys* 4th 13663 by *Merafield Royal Star* 4102.
 1131 II. (210.)—BEN LUSCOMBE, Bowden, Yealinton, Plymouth, for *Bowden Maggie* 3rd 18396, born May 20, 1917, calved April 11, 1923; s. *Bowden Cherry King* 2nd 5306, d. *Maggie* 11035 by *Leigham Sort* 3108.
 1130 III. (26.)—BEN LUSCOMBE, for *Bowden Fidget* 2nd 16342, born Oct. 20, 1916, calved May 31, 1923; s. *Coatswell Yellow Boy* 4014, d. *Fidget* 9261 by *Challenger* 1823.
 1132 R. N.—LORD MIDWAY OF FLEET, Ermington, Devon, for *Lilly* 9th.

Class 148.—*South Devon Heifers, born in 1921.¹*

- 1124 I. (215.)—LORD MIDWAY OF FLEET, Ermington, Devon, for *Flete Countess* 2nd 25432, born Feb. 21; s. *General* 7757, d. *Countess* 2nd 18522 by *Lillians Champion* 6016.
 1133 II. (210.)—HUBERT J. HANNAFORD, Buckland Barton, Newton Abbot, for *Buckland Pearl* 24957, born March 6; s. *Baron* 7543, d. *Ruby* 20th 9780 by *Hacombe Hero* 2902.

Class 149.—*South Devon Heifers, born in 1922.*

- 1136 I. (215.)—LORD MIDWAY OF FLEET, Ermington, Devon, for *Flete Lillian*, born Jan. 6; s. *Trishole Forester* 9590, d. *Lilian's Maid* 14232 by *Doncaster* 3720.
 1135 II. (210.)—HUBERT J. HANNAFORD, Buckland Barton, Newton Abbot, for *Buckland Barbara*, born Feb. 23; s. *Baron* 7543, d. *Beauty* 11311 by *Eversomuch Quality* 3738.

Sussex.

Class 150.—*Sussex Bulls, born in or before 1921.*

- 1138 I. (215. *Champion*,¹ & *Champion*.)—WALTER PHILLIPS, Hermitage Farm, Watlington, Kent, for *Bolebrooke Peaceful Mariner* 5039, born Jan. 11, 1919, bred by Capt. P. R. Mann, Bolebrooke, Hartfield, Sussex; s. *Birling Tom* 4472, d. *Bolebrooke Peaceful Maid* 16969 by *Burgate James* 3630.
 1137 II. (210.)—J. RAYNER BETTS, Greenhill, Ottham, Maidstone, for *Drungewick Courier* 5863, born March 13, 1921, bred by the late E. E. Braby, Drungewick Manor, Rudgwick, Sussex; s. *Somerhill Courier* 4656, d. *Buxom Beauty* 14th 15429 by *Old Joe* 3648.

Class 151.—*Sussex Bulls, born in 1922.*

- 1142 I. (215. *R. N. for Champion*,² & *R. N. for Champion*.)—LORD LECONFIELD, Petworth House, Sussex, for *Petworth Captain* 5782, born Jan. 20; s. *Avissford Launcelet* 4802, d. *Lock Millmaid* 6th 18990 by *Birling Geoffrey* 2nd 4252.

¹ Prizes given by the South Devon Herd Book Society.

² Perpetual Silver Challenge Trophy, value One Hundred Guinea, given through the Sussex Herd Book Society for the best Bull in Classes 150 and 151.

³ Champion Silver Medal given by the Sussex Herd Book Society for the best Bull in Classes 150 and 151.

lxxxvi *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 161.—Red Poll Bulls, born in 1921.¹

- 1196 I. (£15, & R. N. for Champion).—J. B. DIMMOCK, Shotford Hall, Harleston, Norfolk, for *Shotford Duke* 6th 12439, born Jan. 22; s. *Harefield Freemason* 11366, d. *Star Duchess* 104th 25929 by Davyson of Shotford 10555.
 1197 II. (£10).—GRIFFITH R. P. LLEWELLYN, Combend, Elkstone, Cotesbourne, Glos., for *Seven Springs Rambler* 12428, born May 11, bred by Capt. A. Richardson, Seven Springs, Cheltenham; s. *Harefield Clinker* 11000, d. *Kettleburgh Rosie* 4th A1 23572 by Free Trader 10028.
 1195 III. (£5).—CAPTAIN W. G. CLEGG, Abbeywood, Delamere, Northwich, for *Seven Springs Yokel* 12429, born March 6, bred by Capt. A. Richardson, Seven Springs, Cheltenham; s. *Harefield Clinker* 11000, d. *Stowupland Lilac* 25372 by Horoutye Davyson 10421.
 1194 R. N.—LT.-COL. CHARLES BROOK, Kinmount, Anfan, for *Sabam Magic Shadow Show*.

Class 162.—Red Poll Bulls, born in 1922.

- 1204 I. (£15).—LORD WAYERBEE, Horsley Hall, Gresford, North Wales, for *Ashmoor Jouan*, born Jan. 28, bred by A. Carlyle Smith, Sutton Hall, Woodbridge; s. *Ashmoor Pearson* 11525, d. *Ashmoor Joan* 23386 by Dax 957.
 1200 II. (£10).—H. MUNRO CATTLEY, Neutral Farm, Butley, Tunstall, Suffolk, for *Marham Flavius*, born Jan. 29, bred by Thomas Brown & Son, Marham Hall, King's Lynn; s. *Marham Dauntless* 11031, d. *Marham Flirt* 23260 by Ashlyns Count 10125.
 1198 III. (£5).—H. M. THE KING, Sandringham, for *Royal Sportsman*, born April 26; s. *Royal Searchlight* 11765, d. *Royal Herdsman's Choice* 25453 by Letton Mujilini 8th 10759.
 1203 R. N.—MRS. G. C. NEVILLE, Horstead Hall, Norwich, for *Horstead Commodore*.
 H. C.—1201.

Class 163.—Red Poll Cows or Heifers, in-milk, born in or before 1920.

- 1213 I. (£15, & R. N. for Champion).—J. B. DIMMOCK, Shotford Hall, Harleston, Norfolk, for *Shotford Star Duchess* 121st 23187, born Feb. 25, 1918, calved May 19, 1923; s. *Davyson* of Shotford 10555, d. *Star Duchess* 26th 22812 by Shotford Nelson 9742.
 1221 II. (£10).—MAJOR J. A. MORRISON, D.S.O., Basilston Park, Goring, Reading, for *Sudbourne Comfit* 25965, born Aug. 10, 1916, calved April 4, 1923, bred by Kenneth M. Clark, Sudbourne Hall, Orford; s. *Sudbourne Credit* 10796, d. *Sudbourne Comfort* 22555 by Sudbourne Spirey 9751.
 1224 III. (£5).—DAVID TREMBATH, Trelawne, Lancaster Gardens, Clacton-on-Sea, for *Tending Floss* 28th 27326, born Oct. 1, 1916, calved Jan. 24, 1923, bred by Sir J. F. Rowley, Holbeck Park, Hadleigh, Suffolk; s. *Rendlesham Hector* 10663, d. *Tending Floss* 10th 22558 by Combatant 9530.
 1208 R. N.—LT.-COL. SIR MERRICK R. BURRILL, Bt., C.B.E., Knepp Castle, Horsham, for *Knepp Prudence*.
 H. C.—1217. C.—1205.

Class 164.—Red Poll Heifers, born in 1921.¹

- 1225 I. (£15, & Champion).—H. M. THE KING, Sandringham, for *Royal Mavis* 30347, born Jan. 20; s. *Royal Sunshine* 11452, d. *Lady Merle* 25745 by Honingham Alcester 10434.
 1233 II. (£10).—THE MARCHIONESS OF GRAHAM, Brodick Castle, Isle of Arran, for *Easton Absentee* 29831, born April 21; s. *Sudbourne Albion* 11064, d. *Roll Call* 24788 by Red David 10069.
 1237 III. (£5).—THE EXORS. OF THE LATE LORD MANTON, Sudbourne Hall, Orford, Suffolk, for *Sudbourne Daffie* 30494, born Aug. 21, bred by the late Lord Manton; s. *Sudbourne Crimson* 11222, d. *Kitchener's Daffodil* 3rd 26297 by Hermit's Ruby 10873.
 1238 R. N.—THE EXORS. OF THE LATE LORD MANTON, for *Sudbourne Kathleen*.
 H. C.—1240. C.—1227, 1230, 1236.

Class 165.—Red Poll Heifers, born in 1922.

- 1247 I. (£15).—THE EXORS. OF THE LATE LORD MANTON, Sudbourne Hall, Orford, Suffolk, for *Sudbourne Red Queen*, born April 25; s. *Sudbourne Crimson* 11222, d. *Red Lip* 25th 11 by Langsyne 10752.
 1241 II. (£10).—LT.-COL. CHARLES BROOK, Kinmount, Anfan, N.B., for *Kinmount Buttermilk* 2nd, born March 30; s. *Kinmount Stockbroker* 12030, d. *Sudbourne Buttermilk* 25350 by Deaconsfield 10528.
 1244 III. (£5).—MRS. R. M. FOOT, White Hill, Berkhamsted, for *White Hill Dahlia*, born Jan. 19; s. *Sudbourne Hector* 11224, d. *Barvin Dahlia* 27445 by Barvin Salvo 11095.
 1246 R. N.—FELIX W. LEACH, Meddler Stud, Kennett, Newmarket, for *Meddler Early Bird*.
 H. C.—1245.

¹ Prizes given by the Red Poll Cattle Society.

² Champion Prize of £5 given by the Red Poll Cattle Society for the best Bull in Classes 160 & 162.

³ Champion Prize of £5 given by the Red Poll Cattle Society for the best Cow or Heifer in Classes 163-165.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. LXXXVII

Aberdeen-Angus.

Class 166.—Aberdeen-Angus Bulls, born on or before November 30, 1920.

- 1250 I. (**£15, Champion,¹ & Champion.²**)—SIR LEONARD BRASSEY, BT., M.P., Apethorpe Hall, Peterborough, for Black Knight of Auchterarder 45102, born April 26, 1910, bred by A. T. Reid, Auchterarder House, Auchterarder; s. Exmar 41505, d. Blackbird 5th of Braeval 55362 by Prince of Peru 32400.
 1255 II. (**£10, & R. N. for Champion.³**)—CHARLES T. SCOTT, Buckland Manor, Broadway, Worcestershire, for Etrurian of Buckland 45802, born Dec. 1, 1918; s. Etrurian of Bleanon 41489, d. Elasticity of Bywell 51787 by Vallon of Bywell 22650.
 1254 III. (**£5.**)—W. GILCHRIST MACPETH, Dunira, Comrie, Perthshire, for Escalad of Bleanon 48058, born Feb. 28, 1920, bred by Marshall and Mitchell, Bleanon, Blairgowrie; s. Esquire of Harviestoun 43583, d. Escalona of Bleanon 56838 by Prince of Bleanon 31100.
 1249 R. N.—VISCOUNT ALLENDALE, Bywell Hall, Stocksfield-on-Tyne, for Exbert.

Class 167.—Aberdeen-Angus Bulls, born on or between December 1, 1920, and November 30, 1921.³

- 1259 I. (**£15.**)—THE DUKE OF RICHMOND AND GORDON, K.G., Goodwood, Chichester, for Prison of Goodwood 51105, born Dec. 18, 1920; s. Ellartroupe of Goodwood 45573, d. Ruth of Haynes 8th 45912 by Gay Boy of Dunsford 21967.
 1262 II. (**£10.**)—F. HAROLD TURNBULL, Lower House Farm, Llanwit Major, Cardiff, for Proud Padre 51422, born March 28, 1921, bred by J. P. Cummings, Kiermerry, Aberlour; s. Bandsman of Inchgower 44907, d. Princesly Pride 49947 by Every Effort 28043.
 1258 III. (**£5.**)—LORD PENRYN, Wicken Park, Stony Stratford, for Wicken Idiom 51637, born Feb. 7, 1921; s. Tune of Ballinadloch 39579, d. Ideal Pride of Wicken 8th 60907 by Wicken Recluse 37110.
 1261 R. N.—JOHN W. STEWART, Broadmeadows House, Hutton, Berwick-on-Tweed, for Ladas of Broadmeadows.
 C.—1256.

Class 168.—Aberdeen-Angus Bulls, born on or between December 1, 1921, and November 30, 1922.

- 1263 I. (**£15.**)—VISCOUNT ALLENDALE, Bywell Hall, Stocksfield-on-Tyne, for Electricity of Bywell 52341, born Jan. 12, 1922; s. Exbert 45895, d. Eliana 50129 by Pride's Reviver 35660.
 1269 II. (**£10.**)—CHARLES T. SCOTT, Buckland Manor, Broadway, Worcs., for Rufus of Buckland 53633, born Dec. 12, 1921; s. Proud George 38595, d. Ruth of Buckland 3rd 65764 by Etrurian of Bleanon 41498.
 1270 III. (**£5.**)—F. HAROLD TURNBULL, Lower House Farm, Llanwit Major, Cardiff, for Franksome 53401, born March 3, 1922, bred by Brig.-Gen. Lord Saltoun, C.M.G., Philorth, Fraserburgh; s. Boswick 47284, d. Drinnie's Pride 68122 by Echoherd of Ballinadloch 42835.
 1271 R. N.—AUSLIE WATSON, Mindrum, Northumberland, for Black Baron of Auchterarder.
 H. C.—1267.

Class 169.—Aberdeen-Angus Cows or Heifers, in-milk, born on or before November 30, 1920.

- 1273 I. (**£15, R. N. for Champion,⁴ & Champion.⁵**)—J. J. CRIDEAN, Malsenore Park, Gloucester, for Eve 3rd of Malsenore 04328, born May 26, 1919, calved Jan. 3, 1923; s. Idyll of Malsenore 36219, d. Eve of Malsenore 32101 by Brave Briton of Malsenore 30218.
 1272 II. (**£10.**)—VISCOUNT ALLENDALE, Bywell Hall, Stocksfield-on-Tyne, for Elama 2nd of Bywell 63882, born Feb. 22, 1917, calved Jan. 30, 1923; s. Endrick Prince 37064, d. Eliana 48221 by Idelamere 22030.
 1275 III. (**£5.**)—COL. C. W. SOFER-WHITELEY, Addington Park, West Malling, Kent, for Lady Ida of Dallas 63610, born March 3, 1918, calved Dec. 20, 1922, bred by Captain J. Hamilton Houldsworth, Dallas; s. Prince of Perfection 40525, d. Ikona 32995 by Elyn 23100.
 1274 R. N.—THE EARL OF DURHAM, K.G., Lambton Castle, Fence Houses, for Ennie.
 H. C.—1276.

¹ Perpetual Silver Challenge Trophy, value One Hundred Guineas, given through the Aberdeen-Angus Cattle Society, for the best Bull in Classes 166-168.

² Champion Gold Medal given by the Aberdeen-Angus Cattle Society for the best animal in Classes 165-171.

³ Prizes given by the Aberdeen-Angus Cattle Society.

⁴ Champion Gold Medal given by the English Aberdeen-Angus Cattle Association for the best animal of the opposite sex to that of the animal awarded the Champion Gold Medal of the Aberdeen-Angus Cattle Society in Classes 166-171.

lxxxviii *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 170.—Aberdeen-Angus Heifers, born on or between December 1, 1920, and November 30, 1921.

- 1277 I. (£15).—VISCOUNT ALLENDALE, Bywell Hall, Stocksfield-on-Tyne, for *Vellera* of Bywell 68667, born March 5, 1921; s. Exbert 45895, d. Vellozia, of Bywell 51805 by Juan Eric 30753.
 1279 III. (£10).—SIR LEONARD BRASSEY, RT., M.P., Apethorpe Hall, Peterborough, for *Pride of Byches* 68875, born April 10, 1921; s. Black Knight of Auchterarder 45192, d. *Pride of Aberdeen* 621st 62513 by Inman of Waterside 39800.
 1280 III. (£5).—WILLIAM T. FLOVEY, Corpaulding, Cranswick, Yorks, for *Ermosa* of Corpaulding 69511, born Dec. 6, 1920; s. Prince Toreador 44465, d. Ermond of Dalvey 38343 by Evoker of Ballindalloch 36065.
 1282 R. N.—THE EARL OF ROSEBURY, K.G., K.T., Dalmeny House, Edinburgh, for *Elva* of Dalmeny.
 H. C.—1278.

Class 171.—Aberdeen-Angus Heifers, born on or between December 1, 1921, and November 30, 1922.

- 1294 I. (£15, & R. N. for Champion).—JOHN MCG. PETRIK, Asleid, New Deer, Aberdeenshire, for *Evaboxa* 72547, born Jan. 29, 1922; s. Boxer of Ballindalloch 47409, d. *Evapora* 65554 by Earl Taurus of Ballindalloch 89254.
 1296 II. (£10).—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, for *Elate* of Basildon 72410, born Dec. 24, 1921; s. Baron Eros of Bleaton 47225, d. *Eulogy* of Harviestoun 55608 by Electric Bell 29104.
 1284 III. (£5).—VISCOUNT ALLENDALE, Bywell Hall, Stocksfield-on-Tyne, for *Principle* of Bywell 70092, born Jan. 2, 1922; s. Prince George of Bywell 49019, d. *Princess of Leaton* 2nd 57274 by Prince of Jesters 32404.
 1297 R. N.—CHARLES T. SCOTT, Buckland Manor, Broadway, Worcestershire, for *Eliana* 2nd of Buckland.
 H. C.—1285, 1290. C.—1288, 1302.
 Cup.²—VISCOUNT ALLENDALE.

Galloways.

Class 172.—Galloway Bulls born on or before November 30, 1921.

- 1306 I. (£15, & R. N. for Champion).—JOHN CUNNINGHAM, Tarbrooch, Dalbeattie, for *Sapphire* 12268, born May 4, 1914, bred by Thomas Biquet & Sons, Chapleton, Dalbeattie; s. Pure Gem 11356, d. Lizzie 2nd of Chapleton 19464 by Lord William of Durbanhill 7108.
 1305 II. (£10).—SIR ROBERT W. DUCHANAN-JARDINE OF CASTLEMILK, BT., Castlemilk, Lockerbie, for *Mormon of Dalwyne* 12617, born March 17, 1915, bred by John Blackie, Marchhill, Dumfries; s. Matthew Mark 10726, d. Ellen 19549 by Cunningham of Stelford 9185.
 1308 III. (£5).—ROBERT GRAHAM, Auchengassel, Twynholm, for *Sir Furmiston of Craigston* 14154, born Jan. 21, 1919, bred by F. N. M. Gourlay, Milton, Dumfriesshire; s. Raleigh of Killearn 11988, d. Flavia 2nd of Craigston 19850 by Keystone 9689.
 1307 R. N.—ROBERT GRAHAM, Chapel of Logan, Half Morton, Canonbie, for *Horace* of Killearn.

Class 173.—Galloway Bulls, born on or between December 1, 1921, and November 30, 1922.⁴

- 1311 I. (£15).—SIR ROBERT W. DUCHANAN-JARDINE OF CASTLEMILK, BT., Castlemilk, Lockerbie, for *Coronet of Castlemilk* 13088, born Jan. 4, 1922; s. Taurus of Castlemilk 14195, d. *Corona* 2nd of Castlemilk 27023 by Cuthbert 11450.
 1312 II. (£10).—JOHN CUNNINGHAM, Tarbrooch, Dalbeattie, for *Tarbrooch Special* 15001, born Jan. 1, 1922; s. *Sapphire* 12268, d. Queen May 3rd of Tarbrooch 23921 by Cordova 11701.
 1313 III. (£5).—ROBERT GRAHAM, Auchengassel, Twynholm, for *Ewanston A.I.* 15039, born March 10, 1922, bred by James Giehrst, Ewanston, Balmaclolan; s. Grange Abde-Camp 14368, d. *Fashion* of Ewanston 26699 by Kenneth of Killearn 11370.
 1314 R. N.—ROBERT J. PATERSON, Balgray Home Farm, Lockerbie, for *Barmack Conjur* 2nd.

¹ Champion Gold Medal given by the English Aberdeen-Angus Cattle Association for the best animal o. the opposite sex to that of the animal awarded the Champion Gold Medal of the Aberdeen-Angus Cattle Society in Classes 166-171.

² Silver Challenge Cup, value £25, given through the English Aberdeen-Angus Cattle Association for the most points awarded in a combination of entries in Classes 166 to 171, on the basis of: Four points for a First Prize, three points for a Second Prize, two points for a Third Prize, one point for a Reserve, two points for a Championship, and one point for a Reserve for a Championship.

³ The "Dr. Gillespie" Memorial Challenge Trophy, value £50, given by the Galloway Cattle Society for the best Galloway animal in Classes 172-176.

⁴ Prizes given by the Galloway Cattle Society.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. lxxxix

Class 174.—Galloway Cows or Heifers, in-milk, born on or before November 30, 1920,

- 1317 I. (£15. & Champion.)—JOHN CUNNINGHAM, Tarbrooch, Dalbeattie, for **Tarbrooch Blue Bell 3rd** 28383, born May 26, 1910, calved Jan. 10, 1923; s. Sapphire 12268, d. Tarbrooch Blue Bell 22559 by Tarbrooch Chief 10833.
- 1319 II. (£10.)—ROBERT GRAHAM, Chapel of Logan, Half Morton, Canonbie, for **Logan Lady 8th** 26463, born April 1, 1918, calved April 23, 1923; s. Owen of Barrie 12498, d. Logan Lady 2nd 22648 by Ivanhoe 10707.
- 1320 III. (£5.)—SIR JAMES KNOTT, BT., Close House, Wylam-on-Tyne, for **Nora 2nd of Auchengassel** 25334, born March 2, 1910, calved May 1, 1923, bred by Robert Graham, Auchengassel, Twynholm; s. Black Prince 11622, d. Nora of Auchengassel 22596 by Clix 10020.
- 1321 R. N.—JOHN SCOTT, Drumhumbry, by Dalbeattie, for **Drumhumbry Ruby Princess**.

Class 175.—Galloway Heifers, born on or between December 1, 1920, and November 30, 1921.

- 1322 I. (£15.)—SIR ROBERT W. BUCHANAN-JARDINE OF CASTLEMILK, BT., Castlemilk, Lockerbie, for **Lizzie of Castlemilk** 28127, born Dec. 23, 1920, bred by T. Hope Bell, Morington, Dumfries; s. Kenneth of Killoarn 11376, d. Lizzie 17th of Chapelton 25160 by Caesar 10097.
- 1323 II. (£10.)—JOHN CUNNINGHAM, Tarbrooch, Dalbeattie, for **May Queen 22nd of Tarbrooch** 27983, born Dec. 5, 1920; s. Sapphire 12268, d. May Queen 2nd of Glasnick 18489 by Scottish Chief 2nd of Castlemilk 7683.
- 1325 III. (£5.)—ROBERT GRAHAM, Chapel of Logan, Half Morton, Canonbie, for **May Queen of Logan** 28093, born Feb. 27, 1921; s. Quilbier 14037, d. May Queen 3rd of Blackcombe 23392 by Macdougall 3rd of Arkland 9229.
- 1326 R. N.—LADY DOROTHY HENLEY, Askerton Castle, Brampton, Cumberland, for **Grange Baroness 2nd**.

Class 176.—Galloway Heifers, born on or between December 1, 1921, and November 30, 1922.

- 1330 I. (£15.)—JOHN CUNNINGHAM, Tarbrooch, Dalbeattie, for **Tarbrooch Blue Bell 6th** 28453, born Dec. 2, 1921; s. Sir Digby 2nd of Craigneston 14155, d. Tarbrooch Blue Bell 3rd 26883 by Sapphire 12268.
- 1329 II. (£10.)—JOHN CUNNINGHAM, for **May Queen 27th of Tarbrooch** 28457, born Feb. 5, 1922; s. Sir Digby 2nd of Craigneston 14155, d. May Queen 21st of Tarbrooch 27470 by Sapphire 12268.
- 1334 III. (£5.)—D. & J. LITTLE, Corriehalls, Lockerbie, for **Lady Nan of Corriehalls** 28656, born Jan. 19, 1922; s. Kennedy of Killoarn 14106, d. Nettie 2nd of Corriehalls 25437 by Cockatoo 2nd of Stepford 11669.
- 1333 R. N.—LADY DOROTHY HENLEY, Askerton Castle, Brampton, for **Grange Stately 2nd**.

Dun and Belted Galloways.

Class 177.—Dun Galloway Bulls, born on or before November 30, 1922.¹

- 1337 I. (£15.)—ROBERT GRAHAM, Auchengassel, Twynholm, for **Mark Barney 8 D.**, born May 8, 1921; s. Captain, d. Meg.

Class 178.—Dun Galloway Cows or Heifers, in-milk, born on or before November 30, 1920.

- 1340 I. (£15.)—ROBERT GRAHAM, Auchengassel, Twynholm, for **Knockycrook Dandy 2nd 78 D.**, born in April, 1919, calved Feb. 20, 1923, bred by William Hyslop, Knockycrook, Barrhill.
- 1339 II. (£10.)—THE MARQUIS OF BUTE, K.T., Mount Stuart, Rothesay, for **Bute Thirty-Seven 35 D.**, born in 1916, calved April 13, 1923.
- 1348 III. (£5.)—THE MARQUIS OF BUTE, K.T., for **Bute Thirteen 17 D.**, born in 1918, calved April 16, 1923.

Class 179.—Belted Galloway Bulls, born on or before November 30, 1922.²

- 1346 I. (£15.)—THE MARQUIS OF BUTE, K.T., Craigeach, Kirkcowan, Wigtownshire, for **Moehrum Royal Record of Craigeach 61 B.**, born March 10, 1919, bred by Robert Graham, Auchengassel, Twynholm; s. Mark Champion 55 B., d. Mark Fanny 211 B.
- 1349 II. (£10.)—JOHN B. SPICAT, Lennox Plunton, Borge, Kirkcubright, for **Plunton Jumbo 63 B.**, born May 30, 1920, bred by Col. McNeill, Corseriggan, Kirkcowan, Wigtownshire.
- 1343 III. (£5.)—MRS. BROW, of Knockbrax, Kirkcubright, for **Knockbrax Pollux 49 B.**, born Feb. 22, 1921; s. Knockbrax Viking 50 B., d. Knockbrax Pansy 183 B. by Boreland Champion 21 B.
- 1341 R. N.—JAMES J. BELL-IRVING, Makerstown, Kelloe, for **Makerstown Dun Dan**.

¹ The "Dr. Gillespie" Memorial Challenge Trophy, value £50, given by the Galloway Cattle Society for the best Galloway animal in Classes 172-178.

² Prizes given by the Dun and Belted Galloway Cattle Breeders' Association.

xc Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.

Class 180.—*Billed Galloway Cows or Heifers, in-milk, born on or before November 30, 1920.*

- 1352 I. (£15).—MRS. BROWN, of Knockbrex, for Knockbrex Lady Belinda 175 B., born Aug. 19, 1920, calved June 3, 1923; s. Knockbrex Viking 50 B., d. Knockbrex Empress 172 B. by Knockbrex First Choice 40 B.
 1356 II. (£10).—ROBERT GRAHAM, Auchengassel, Twynholm, for Mark Fanny 211 B., born in May, 1915, calved May 25, 1923; s. Legacy, d. Old Fan.
 1350 III. (£5).—JAMES J. BELL-IRVING, Makerstoun, Kelso, for Makerstoun Romance 199 B., born March 29, 1919, calved April 1, 1923; s. Rokeby End.
 1351 R. N.—MRS. BROWN, of Knockbrex, for Knockbrex Confidence.

Blue Albions.

Class 181.—*Blue Albion Bulls, born in or before 1922.*

- 1363 I. (£15).—G. B. MORTON, Brown Hill Farm, Buxton, for Bradbourne Goalkeeper 31, age unknown, bred by A. Trafford, Dulands Farm, Bradbourne, Ashbourne.
 1359 II. (£10).—PERRY DOBSON, Manor Farm, Ridgwardine, Market Drayton, for Hurdlow Champion 61, born in 1920, breeder unknown.
 1361 III. (£5).—LT.-COL. W. E. HARRISON, O.B.E., Wychnor Park, Burton-on-Trent, for England's Glory 49, breeder and age unknown.
 1365 R. N.—THOMAS SHIMWELL & SONS, Home Farm, Rowsley, Derbyshire, for Statton Earl of Derby.

Class 182.—*Blue Albion Cows or Heifers, in-milk, born in or before 1920.*

- 1375 I. (£15).—HENRY E. SMITH, Lower Farm, Willenhall, Wolston, Coventry, for Willenhall Bright Eyes 54 X 22, calved June 27, 1923, breeder and age unknown.
 1368 II. (£10).—ARNOLD GILLET, Ridgewood, Chorley, Lancs., for Bradbourne Gentle 11 X 54, age unknown, calved June 1, 1923, bred by A. Trafford, Dulands Farm, Bradbourne.
 1376 III. (£5).—WILFRED L. STEEL, Ranton Abbey, Haughton, Stafford, for Bradbourne Future Princess 950, calved June 19, 1923, breeder and age unknown.
 1374 R. N.—HENRY E. SMITH, for Bank Helen.

Class 183.—*Blue Albion Heifers, born in 1921.¹*

- 1383 I. (£15).—CAPTAIN A. V. MILTON, Grasmere, Birstwith, Harrogate, for Bradbourne Seashell 990, born June 19, bred by A. Trafford, Bradbourne, Ashbourne; s. Bradbourne Milkman 33, d. Bradbourne Hannah 186.
 1385 II. (£10).—ARTHUR PETERS, Blagdon Farm, Cranborne, Salisbury, for Blagdon Princess Royal 189 X 1, breeder unknown.
 1379 III. (£5).—C. H. CAPON, Waterend House, Wheathampstead, for Waterend Marvel 88 X 53, born Feb. 2, bred by S. Wallace, Bedwell Park, Bedford; d. Bluebell 2nd.
 1387 R. N.—RANDOLPH TORY, Charlsworth Manor, Blandford, for Charlsworth Princess Royal.

Class 184.—*Blue Albion Heifers, born in 1922.¹*

- 1391 I. (£15).—LT.-COL. W. E. HARRISON, O.B.E., Wychnor Park, Burton-on-Trent, for Norton Babs, bred by S. H. Swire, Norton-in-Hales, Market Drayton.
 1393 II. (£10).—LT.-COL. W. E. HARRISON, O.B.E., for Thorn Missie, breeder unknown.
 1390 III. (£5).—ARNOLD GILLET, Ridgewood, Chorley, Lancs., for Bradbourne Vivian 2nd 11 X 70, born Feb. 6, bred by A. Trafford, Dulands Farm, Bradbourne, Ashbourne; s. Bradbourne Dairyman, d. Bradbourne Vivian.
 1395 R. N.—WILFRED L. STEEL, Ranton Abbey, Haughton, Stafford, for Ranton Venus.

Park Cattle.

Class 185.—*Park Polled or Horned Bulls, born in or before 1922.*

- 1400 I. (£15).—BRIG.-GEN. K. KINCADIN SMITH, St. Oystins Priory, Colechester, for Rex 185, born Nov. 17, 1920, bred by J. Cator, Woodbastwick Hall, Norwich; s. Woodbastwick Peter 67, d. Woodbastwick Bluestocking 2nd 380.
 1399 II. (£10).—MAJOR Q. E. GURNEY, Bawdeswell Hall, Norfolk, for Bawdeswell Alpha 165, born Dec. 12, 1920; s. Bawdeswell Somers 45, d. Bawdeswell Albania 170.
 1401 III. (£5).—MRS. LANCASTER, Home Farm, Kelmash, Northampton, for Kelmash Jack, born Jan. 16, 1922, bred by J. Cator, Woodbastwick Hall, Norwich; s. Bawdeswell Plevna 43, d. Jollity 3rd.

Class 186.—*Park Polled or Horned Cows or Heifers, in-milk, born in or before 1920.²*

- 1403 I. (£15).—MAJOR Q. E. GURNEY, Bawdeswell Hall, Norfolk, for Bawdeswell Spirea 508, born Feb. 29, 1920, calved May 13, 1923, bred by Mrs. R. Gurney, Northrepps Hall, Norwich; s. Northrepps Woodwick 55, d. Northrepps Spot 284.

¹ Prizes given by the Blue Albion Cattle Society.

² Prizes given by the Park Cattle Society.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. xci

- 1404 I. (210).—BRIQ-GEN. K. KINQARD SMITH, St. Oystha Priory, Colchester, for *Jasper* 3rd 610, born April 11, 1919, calved Jan. 6, 1923, bred by J. Cator, Woodbastwick Hall, Norwich; s. Woodbastwick Cumberland 2nd 63, d. Woodbastwick Jasper 370.
1402 III. (25).—J. CATOR, Woodbastwick Hall, Norwich, for *Blackberry* 3rd 350, born Sept. 26, 1917, calved Jan. 23, 1923; s. Sticksby 2nd, d. Blackberry by Lancaster.

British Friesians.

Class 187.—British Friesian Bulls, born in or before 1920.

- 1410 I. (215, & R. N. for Champion).—GEORGE T. EATON, Thurston Hall, Framfield, Sussex, for *Kirkhill Dorin* 10045, born March 26, 1918, bred by Dr. W. Sinclair, Lobston, Nigg, by Aberdeen; s. Kirkhill (imported) Karel 2nd 4051, d. Kirkhill Queen 2390 by Colton Queen's Own 97.
1406 II. (210).—ARTHUR ALLEN, The Manor, Chesterblade, Somerset, for *Kingswood Ynteserie* 14531, born June 17, 1920, bred by Horace Hale, Kingswood, Tanbridge, Surrey; s. Hedges Second Series 6427, d. Kingswood Gem 25292 by Kingswood (imported) Ynte 4047.
1415 III. (25).—W. G. PLAYER, Ednaston Manor, Derbyshire, for *Knebworth Ynte's Grand Parade* 12089, born Nov. 4, 1919, bred by W. & R. Wallace, Swangley, Knebworth Herts.; s. Kingswood (imported) Ynte 4047, d. Knebworth Eva 25230 by Knebworth (imported) Cesar 4065.
1407 R. N.—THE MARQUIS OF BUTE, K.T., Mount Stuart, Rothesay, for *Tarvin Pel* Class 2nd, H. C.—1412, 1413. C.—1416, 1417.

Class 188.—British Friesian Bulls, born in 1921.

- 1424 I. (215, & Champion).—G. HOLZ THOMAS, North Dean House, Hughenden, High Wycombe, for *Northdean* (imported 1922) *Marthus Beatty* 21081, born Nov. 25, bred by Edgar J. Webb & Sons, Treespruit, O.F.S., Africa; s. Admiral Beatty 987 S.A.S.B., d. Martha of Kopjeskraal 1597 S.A.S.B. by Adolf 256 S.A.S.B.
1425 II. (210).—LORD RAYLEIGH, Terling, Witham, Essex, for *Terling* (imported 1922) *Marthus* 21533, born May 18, bred by Golden Valley Citrus Estates, Ltd., South Africa; s. Craigie Marthus 3rd 61 F.H.B.S.A., d. Miedema 4th 1651 S.A.S.B. by Johan Ceres 5679 F.R.S.
1422 III. (25).—THOMAS FOSTER, Treas Farm, Pannal, Harrogate, for *Rosetti Lascelles* 18443, born Jan. 28; s. Colton Bert Bram 11349, d. Colton Dairymaid 17266 by Colton Sultan 2525.
1427 R. N.—JAMES RUSSEL, Mapleton, Edenbridge, for *Mapleton* (imported 1922) *Hilko*. H. C.—1429. C.—1421.

Class 189.—British Friesian Bulls, born on or between January 1 and June 30, 1922.¹

- 1432 I. (215).—JOHN HOUTSON, Langside, Port Glasgow, for *Royal Akkelander* 21325, born April 16; s. Cradlehall (imported) Hollander 2nd 3737, d. Garton (imported) Akke 6th 1794 by Albert 2nd 5611 F.H.S.
1429 II. (210).—GEORGE T. EATON, Thurston Hall, Framfield, Sussex, for *Thurston Karel Khedive* 21577, born Feb. 11; s. Kirkhill (imported) Karel 2nd 4951, d. Buckingham Berry 3rd 23764 by Bendrose Boss 2351.
1435 III. (25).—C. C. SCHOLFIELD, Willow Farm, Tadcaster, for *Austin Vic Cesar* 19211, born Jan. 1; s. Dunninall (imported) Cesar 2nd 3815, d. Austin Gay Kidly 31746 by Golf Botermijn 2nd 6327.
1434 R. N.—ALBERT G. MOBBS, Swavesey Lodge, Oulton, Lowestoft, for *Oulton* (imported 1922) *Officer*. H. C.—1434.

Class 190.—British Friesian Bulls, born on or between July 1 and December 31, 1922.²

- 1440 I. (215).—MRS. JOHNSON, The Gadlas, Ellesmere, for *Hamels Roland* 20227, born Oct. 16, bred by F. Furness, Hamels Park, Buntingford; s. Seston Roland 10593, d. Dunninall Daphne 14532 by Dunninall Agility 1165.
1443 II. (210).—FRIEND SYKES, Richings Park, Colnbrook, Bucks., for *Richings Ceres Gentleman* 21291, born Aug. 5; s. Hedges Second Series 6427, d. Kingswood Gentle 25204 by Kingswood (imported) Ynte 4047.
1439 III. (25).—JOHN HERRING, Plas Llanfair, Llanfair P.G., Anglesey, for *Llanfair Paul* 20753, born Sept. 16; s. Cresskell (imported 1922) Chief 19700, d. Llanfair (imported 1922) Diliema 63772 by Paul 1465 S.A.S.B.
1442 R. N.—G. B. RADCLIFFE, Pool Bank, Tarvin, Cheshire, for *Tarvin Janke's Chief*.

¹ Champion Prize of £5 given by the British Friesian Cattle Society for the best Bull in Class 187-190.

² Prizes given by the British Friesian Cattle Society.

xcii *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 191.—British Friesian Cows, in-milk, born in or before 1919.

- 1453 I. (£15).—GEORGE T. EATON, Thurston Hall, Framfield, Sussex, for Petygards Ceres 29080, born Oct. 30, 1916, calved May 19, 1923, bred by Capt. R. G. Buxton, Petygards, Sporre, King's Lynn; s. Petygards (imported) Bles Albert 4321, d. Petygards Clara 15670 by Petygards Foreman 1896.
 1461 II. (£10).—G. HOLT THOMAS, North Dean House, Hughenden, High Wycombe, for Kingswood Ceres Myrtle 39934, born Jan. 28, 1910, calved June 8, 1923, bred by Horace Hale, Kingswood, Tandridge; s. Hedges Second Series 6427, d. Kingswood Myrtle 9234 by Kingswood Prince 341.
 1475 III. (£5).—WALTER RIDLEY & SONS, Chollerton Farm, Wall, Northumberland, for Routh Fancy 44b 26392, born June 18, 1916, calved June 18, 1923, bred by Percy Ford, Molescroft Grange, Beverley; s. Routh Ringleader 1965, d. Routh Fancy 11649 by Sidley Ambush 533.
 1459 R. N.—THE HACHE HERD, Muntham Home Farm, Findon Worthing, for Seaton Johanna.
 H. C.—1446, 1457, 1467. C.—1450, 1474.
 1453. 1489, 1538 (Cup).—GEORGE T. EATON, for Petygards Ceres, Thurston Ellen and Thurston Mare Verhena.
 1461, 1494, 1521 (R. N. for Cup).—G. HOLT THOMAS, for Kingswood Ceres Myrtle, Northdean Meibloem and Northdean Bonnie Annie.

Class 192.—British Friesian Heifers, in-milk, born in 1920.²

- 1494 I. (£15, & R. N. for Champion).—G. HOLT THOMAS, North Dean House, Hughenden, High Wycombe, for Northdean Meibloem 47738, born June 25, calved Nov. 5, 1922; s. Dell Hollander 7655, d. Moordale (imported) Meibloem 18708 by Max 5899 F.R.S.
 1489 II. (£10).—GEORGE T. EATON, Thurston Hall, Framfield, Sussex, for Thurston Ellen 49368, born April 26, calved Jan. 19, 1923; s. Kirkhill (imported) Karel 2nd 4051, d. Kirkhill Nellie 2nd 18274 by Colton Queen's Own 97.
 1487 III. (£5).—A. and J. BROWN, Haydon Hill, Aylesbury, for Hedges Albert Spinkia 45848, born April 22, calved May 18, 1923; s. Petygards (imported) Bles Albert 4321, d. Corsebar Rose 24018 by Moss (imported) Adema 49th 4223.
 1493 R. N.—G. HOLT THOMAS, for Northdean Gladys.
 H. C.—1496, 1498, 1502. C.—1497, 1500.

Class 193.—British Friesian Heifers, born in 1921.²

- 1511 I. (£15, & Champion).—ERNEST BURNES, Hamels Park, Buntingford, for Hamels Froukie's Feule 53250, born March 27; s. Terling (imported) Vic Bertus 4541, d. Hedges (imported) Froukie 3rd 18090 by Ceres 4497 F.R.S.
 1523 II. (£10).—JOHN HOUTSON, Langside, Port Glasgow, for Royal Hollakke 56656, born April 16; s. Cradlehall (imported) Hollander 2nd 3737, d. Garton (imported) Akke 6th 17794 by Albert 2nd 5611 F.R.S.
 1521 III. (£5).—G. HOLT THOMAS, North Dean House, Hughenden, High Wycombe, for Northdean Bonnie Annie 53609, born March 21; s. Dell Hollander 7655, d. Hedges Bonnie Annie 1698 by Hedges Hawking Duke 283.
 1518 R. N.—LIEUT.-COL. W. E. HARRISON, O.B.E., Wychnor Park, Burton-on-Trent, for Wychnor Lornus.
 H. C.—1503, 1506, 1514, 1516, 1519. C.—1508, 1515, 1525.

Class 194.—British Friesian Heifers, born on or between January 1 and June 30, 1922.

- 1538 I. (£15).—GEORGE T. EATON, Thurston Hall, Framfield, Sussex, for Thurston Karel Verhena 66884, born Feb. 15; s. Kirkhill (imported) Karel 2nd 4051, d. Petygards Ceres 29080 by Petygards (imported) Bles Albert 4321.
 1542 II. (£10).—LT.-COL. W. E. HARRISON, O.B.E., Wychnor Park, Burton-on-Trent, for Wychnor Lornus 2nd 67744, born Jan. 10; s. Wychnor Frits 7215, d. Colton Lornus 32834 by Terling (imported) Vic Bertus 4541.
 1556 III. (£5).—W. and R. WALLACE, Swangley, Knebworth Station, Herts, for Knebworth Ynte's Lillian 3rd 63253, born April 25; s. Kingswood (imported) Ynte 4947, d. Knebworth Lillian 55299 by Cradlehall Hollander 2nd 3737.
 1534 R. N.—A. and J. BROWN, Haydon Hill, Aylesbury, for Hedges Dairy Girl.
 H. C.—1539, 1541, 1551. C.—1536, 1544.

Class 195.—British Friesian Heifers, born on or between July 1 and December 31, 1922.²

- 1570 I. (£15).—W. and R. WALLACE, Swangley, Knebworth Station, Herts, for Knebworth Dawn Mist 63219, born Sept. 17; s. Hedges Second Series 6427, d. Kingswood Dawn Mist 25194 by Kingswood (imported) Ynte 4947.

¹ Silver Challenge Cup, value Fifty Guinea, given through the British Friesian Cattle Society for the best group of three Cows or Heifers in Classes 191-195.

² Prize given by the British Friesian Cattle Society.

³ Champion Prize of £5 given by the British Friesian Cattle Society for the best Cow or Heifer in Classes 191-195.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. xciii

- 1559 II. (210.)—A. and J. BROWN, Haydon Hill, Aylesbury, for *Hedres John's Peggy* 62418, born Aug. 22; s. Wigginton (imported) Johan 4037, d. Moss Peggy 25799 by Moss (imported) Adema 49th 4223.
- 1560 III. (25.)—GEORGE T. BARON, Thurston Hall, Framfield, Sussex, for *Thurston Karel Walldower* 2nd 66840, born July 5; s. Kirkhill (imported) Karel 2nd 4051, d. Knebworth Maria 2nd 9490 by Knebworth Conqueror 361.
- 1561 E. W.—THE HACHE HERD, Muntam Home Farm, Findon, Worthing, for *Hache Worth*.
H. C.—1563, 1565, 1571. C.—1567, 1568.
Challenge Trophy.—G. HOLT THOMAS. •
R. N. for Trophy.—GEORGE T. BARON.

Ayrshires.

Class 196.—Ayrshire Bulls, born on or before September 1, 1921.

- 1575 I. (215.)—JAMES HOWIE, Hillhouse, Kilmarnock, for *Kirkland All Alone*, born in Nov., 1918, bred by W. Murray, Kirkland, Closeburn; s. Barbolgh Dignity 14806, d. Auchenshield Lady Nestle 53970 by Auchenshield Bright Star 10938.
- 1574 II. (210.)—WILLIAM L. FERGUSON, Catlins, Lockerbie, for *Catlins Dreadnought* 19148, born Feb. 10, 1919; s. Hobsland Victory 16489, d. Catlins Princess Alice 51043 by Brae Rising Star 8187.
- 1577 III. (25.)—J. H. MURRAY, Stockfield Hall, Stockfield-on-Tyne, for *Kirkland Clockwork* 17898, born Oct. 18, 1917, bred by W. Murray, Kirkland, Closeburn; s. Barbolgh Dignity 14806, d. Kirkland Ellen 33337 by Kirkland Zam-Buk 8574.
- 1572 R. N.—A. Y. ALLAN, Aitkenbar, Dumbarton, for *Aitkenbar Magnet*.
H. C.—1578, 1579.

Class 197.—Ayrshire Bulls, born after September 1, 1921.

- 1578 I. (215.)—JAMES HOWIE, Hillhouse, Kilmarnock, for *Hobsland Duplicate* 22581, born March 25, 1922, bred by Thomas Barr, Hobsland, Monkton; s. Hobsland Lucky Boy 16482, d. Hobsland Lovely 5th 51072 by Hobsland Perfect Piece 10662.
- 1579 II. (210.)—MURDO STOKAN, Douglas Hall, Bechelehan, for *Douglas Hall Artisan* 22648, born Feb. 25, 1922; s. *Milberts Perfection* 17876, d. Douglas Hall Rosebud 36455 by Douglas Hall Atton Castle 10327.

Class 198a.—Ayrshire Cows, in-milk, born on or before September 1, 1919.

- 1583 I. (215.)—THE HON. G. CORBETT, Kowallan, Kilmarnock, for *Auchenbrain Yellow Kate* 12th 54219, born in Jan., 1915, calved May 22, 1923, bred by D. and W. Wallace, Auchenbrain, Manichline; s. Leassnessock Golden Love 11003, d. Auchenbrain Yellow Kate 8th 54672 by Leassnessock Goodlift 7368.
- 1589 II. (210.)—A. Y. ALLAN, Aitkenbar, Dumbarton, for *Aitkenbar Jamaica* 77063, born Jan. 2, 1918, calved June 11, 1923; s. Netherton Brigadier 15178, d. Aitkenbar Jessie 3rd 48093 by Netherton King Culbert 8238.
- 1602 III. (25.)—F. H. SANDERSON, Eshott Home Farm, Felton, Northumberland, for *Newlands Sunbeam* 70748, born Jan. 17, 1918, calved April 24, 1923, bred by C. H. Sanderson, Newlands, Belford; s. Braw Lad 15721, d. Broadmoor Sunbeam 2nd 39951 by Knockerra Coronation 8740.
- 1592 R. N.—A. and A. KIRKPATRICK, Barr, Sanguhar, for *Auchenbay Meg*.
H. C.—1585, 1587, 1588, 1589, 1591, 1597.

Class 198b.—Ayrshire Cows, in-calf, born on or before September 1, 1919.²

- 1600 I. (215.)—JACOB S. MURRAY, Dalgie, New Cumnock, for *Carston Rhode* 52271, born 5th April, 1915; s. Carston St. Thomas 7904, d. Carston Underella 2nd 36325 by Carston Merry King 26608.
- 1593 II. (210.)—A. and A. KIRKPATRICK, Barr, Sanguhar, for *Barr Maud* 62781, born March 11, 1914, bred by H. Young, Redhills, Dumfries; s. Redhills Royal Chief 869, d. Redhills Nannie (Vol. 31, p. 949) by Redhills Everlasting 6169.
- 1596 III. (25.)—WILLIAM L. FERGUSON, Catlins, Lockerbie, for *Catlins Princess Alice* 61043, born March 24, 1915; s. Brae Rising Star 8187, d. Ardgowan Princess Lizzie 22241 by Corra Black Prince 8072.
- 1581 R. N.—A. Y. ALLAN, Aitkenbar, Dumbarton, for *Aitkenbar Vera*.
H. C.—1584, 1588, 1603.

¹ Perpetual Silver Challenge Trophy, value Fifty Guineas, given by the Friesland Cattle Breeders' Association for the best group of three British Friesian animals bred by Exhibitor in Classes 187-195.

² Prizes given by the Ayrshire Cattle Bond Book Society.

xciv *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 199a.—Ayrshire Cows or Heifers, in-milk, born after September 1, 1919.

- 1806 I. (215).—WILLIAM L. FERGUSON, Catlins, Lockerbie, for Auchinbay Blackie 7th 68940, born March 17, 1920, calved July 4, 1923, bred by James S. Ferguson, Auchinbay, Ochiltree; s. Lessnessock Standard 17167, d. Auchinbay Blackie 4th 82255 by Auchinbay Scotland Yet 7816.
1609 II. (210).—MUNGO SLOAN, Douglas Hall, Ecclefechan, for Douglas Hall Sunflower 77833, born Sept. 19, 1920, calved April 20, 1923; s. Roundbush Union Jack 18848, d. Douglas Hall Snowdrop 2nd 77831 by Douglas Hall Leap Year 16722.

Class 199b.—Ayrshire Cows or Heifers, in-calf, born after September 1, 1919.

- 1608 I. (215).—C. H. SANDERSON, Newlands, Belford, Northumberland, for Newlands Mary 3rd 77368, born Feb. 8, 1921; s. Kirkland Corner Stone 19441, d. Newlands Mary 70739 by Howie's Dairyman.
1604 II. (210).—TAE HON. G. CORBERT, Rowallan, Kilmarnock, for Rowallan Kate Mendel 79548, born April 15, 1921; s. Holsland Mendel 18422, d. Auchenbrain Yellow Kate 12th 54219 by Lessnessock Golden Love 11003.
1610 III. (25).—MUNGO SLOAN, Douglas Hall, Ecclefechan, for Douglas Hall Floss 2nd 77808, born July 26, 1920; s. Douglas Hall Leap Year 16722, s. Douglas Hall Floss 53130 by Slodshill Star 12445.
1605 R. N.—CHARLES DOUGLAS, Auchloch, Lesmahagow, for Auchloch Noreen. H. C.—1607.

Guernseys.

N.B.—Unless otherwise stated the numbers refer to the English Guernsey Herd Book.

Class 200.—Guernsey Bulls, born in or before 1921.

- 1612 I. (215, & Champion).—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, Devon, for Hammill of Marazion 3834, fawn and white, born Dec. 14, 1916, bred by Lady Marnes Boscawon, Tregey, Porthanwell, Cornwall; s. Tregonning Good Friday 2nd 2561, d. Fanny 7634 by Eryngium 2016.
1613 II. (210).—A. CHESTER BRATTY, Calvehill Park, Little Chart, Kent, for Murrell Golden Cheer 3993, red and white, born April 1, 1919, bred by Mrs. W. H. Palmer, Heathlands, Wokingham; s. Murrell Lord Roberts 3375, d. Murrell Golden Cherry 16223 by Haye Vido 2nd 2460.
1619 III. (25).—LORD POLTIMORE, Court Hall, North Molton, Devon, for Queen's Fanny 4913, fawn and white, born Feb. 22, 1917, bred by G. E. de Garis, St. Leddards, Castel, Guernsey; s. Justice's Kicora 3239 P.S., R.G.A.S., d. Queen of St. Leddards 1361 P.S., R.G.A.S. by Fanny's Lad 2863 P.S., R.G.A.S.
1611 R. N.—MRS. R. C. BAINBRIDGE, for Elfordleigh Hammill. H. C.—1614. C.—1617.

Class 201.—Guernsey Bulls, born in 1922.

- 1624 I. (215, & R. N. for Champion).—VISCOUNT LASCELLES, K.G., Goldsborough Hall, Knarborough, for Primrose's Bellfounder 4734 P.S., R.G.A.S., fawn and white, born Jan. 23, bred by G. Edwards, Castel Farm, Guernsey; s. Primrose Emblem 4581 P.S., R.G.A.S., d. Lady Ostend of the Ponchez 5215 P.S., R.G.A.S., by Detsy Pride of the Ponchez P.S., R.G.A.S.
1622 II. (210).—J. B. BODY, Hindhead Court, Hindhead, Surrey, for Hindhead Governor 4842, fawn and white, born Oct. 24, 1922; s. Governor 4th des Ruettes 3718, d. Rosey of Goodnations 12343 by Gunner 3rd 2459.
1625 III. (25).—HILTON PHILLIPS, Broom Hill, Esher, Surrey, for Claremont Prince 4262, fawn and white, born July 20, bred by the late Duchess of Albany, Claremont, Esher; s. Bittleware Princeling 3232, d. Holywell Princess 13627 by Downe Star of Vimbra 2nd 3315.
1621 R. N.—MRS. R. C. BAINBRIDGE, Elfordleigh, Plympton, Devon, for Elfordleigh Hammill 2nd. H. C.—1623. C.—1626.

Class 202.—Guernsey Cows, in-milk, born in or before 1919.

- 1633 I. (215, & Champion).—W. DUNKLES, Fernhill Park, Windsor Forest, for Wickham Rose of Rouge Val 14063, fawn and white, born Aug. 1, 1917, calved March 8, 1923, bred by W. Marriott, Rouge Rue, St. Peter Port, Guernsey; s. Lively's Sailor Boy of Les Quaters 3622 P.S., R.G.A.S., d. Rose of Rouge Val 5173 P.S., R.G.A.S.
1632 II. (210).—J. B. BODY, Hindhead Court, Hindhead, Surrey, for Lynchmere Rose 12341, fawn and white, born Aug. 12, 1918, calved May 23, 1923, bred by Mrs. Pratt-Barlow, Lynchmere House, Haslemere; s. Sequel's Delight 2nd 3403, d. Rosey of Goodnations 12343 by Gunner 3rd 2459.

¹ Prizes given by the Ayrshire Cattle Herd Book Society.

² Champion Prize of £5 given by the English Guernsey Cattle Society for the best Bull in Classes 200 and 201.

³ Champion Prize of £5 given by the English Guernsey Cattle Society for the best Cow or Heifer in Classes 202-204.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. xcv

- 1620 III. (25.)—A. CHESTER BRATTY, Calchill Park, Little Chart, Kent, for *Lily of L'Aumone* 2nd 14355, fawn and white, born Oct. 25, 1917, calved Jan. 21, 1923, bred by E. T. Wheldon, St. Peter Port, Guernsey; s. *May Boy of Mont Plaisant* 3563 P.S., R.G.A.S., d. *Lily of L'Aumone* 14527 P.S., R.G.A.S., by Honoria's Sequel 2nd 2816 P.S., R.G.A.S.
1635 R. N.—MRS. JERVOISE, Herriard Park, Basingstoke, for *Ruby 4th of Le Mont Durant*. H. C.—1630, 1637. C.—1636.

Class 203.—Guernsey Cows or Heifers, in-milk, born in 1920 or 1921.¹

- 1640 I. (215, & R. N. for Champion.)—J. B. BODY, Hindhead Court, Hindhead, Surrey, for *Morland Lady Richmond* 16788, fawn and white, born Feb. 15, 1921, calved April 28, 1923, bred by G. F. Ferrand, Morland Hall, Alton; s. *Slogan's Climax* 4035, d. *Richmond Zoe of le Kuetle* 13846 by Ivy's Emile 3804.
1641 II. (210.)—W. DUNKELS, Fernhill Park, Windsor Forest, for *Hopes Flossie* 15423, fawn and white, born May 5, 1920, calved April 28, 1923, bred by Sir E. A. Hambro, Hayes Place, Kent; s. *Lord Kitchener of Rose Farm* 212 by Nelson of the Cachetiere 174 P.S., R.G.A.S., d. *Flossie of Lubin* 3rd 15347 P.S., R.G.A.S.
1642 III. (25.)—MRS. JERVOISE, Herriard Park, Basingstoke, for *Herriard Dora* 2nd 15440, fawn and white, born Sept. 11, 1920, calved April 18, 1923; s. *Herriard Ouse's Kedra* 3726, d. *Herriard Dora* 13593 by *Herriard du Foulon* 3158.
1639 R. N.—A. CHESTER BRATTY, Calchill Park, Little Chart, Kent, for *Belmont Buttercup* 1st. H. C.—1644.

Class 204.—Guernsey Heifers, born in 1922.

- 1647 I. (215.)—W. DUNKELS, Fernhill Park, Windsor Forest, for *Dairymaid of Goodstone* 2nd 17554, fawn and white, born April 2, bred by H. F. Plumtree, Goodstone Park, Canterbury; s. *Rose Lad of Goodstone* 3rd 4303, d. *Dairymaid of Altheby* 3rd 11227 by *Golden Noble* 6th 2753.
1652 II. (210.)—G. P. SANDAY, Puddington Hall, Newton, Cheshire, for *Puddington Dafodil* 18226, fawn and white, born Jan. 9; s. *Lively's Honour Les Quarters* 2077, d. *Havencroft Dafodil* 2nd 9641 by *Gladiator* 2276.
1646 III. (25.)—J. B. BODY, Hindhead Court, Hindhead, Surrey, for *Hindhead Princess Rosey* 17889, fawn and white, born May 4; s. *Lynchmere Lord Roberts* 15th 3952, d. *Lynchmere Rosey* 13731 by *Sequel Delight* 2nd 3403.
1645 R. N.—J. B. BODY, for *Hindhead Princess Miriam*. H. C.—1649. C.—1643.

Jerseys.

N.B.—In the Jersey Classes the number inserted within brackets after the name of an animal indicates the number of such animal in the Island Herd Book. A number without brackets indicates that the animal is registered in the English Jersey Herd Book.

Class 205.—Jersey Bulls, born in or before 1920.

- 1659 I. (215, & Champion.)—R. BRUCE WARD, Godinton, Ashford, Kent, for *Pilgrim* 12609, whole colour, born April 14, 1919; s. *Prometheus* 13391, d. *Evergreen* by *Catillon's Prince* 11639.
1654 II. (210, & R. N. for Champion.)—R. W. CARSON, Halse, Brackley, for *Don Cid* 13547, black, born March 24, 1919, bred by Mrs. Hayes Sadler, Sutton Scotney; s. *The Cid* 12473, d. *Donna Yvonne* by *Fontaines Oxford* Lad 12003.
1658 III. (25.)—MRS. HAYES SADLER, Nornbury, Sutton Scotney, for *Spring Gambowlines Lad* 14129, whole colour, born June 23, 1920, bred by S. G. Hensh, Springhouse Park, Theydon Bois; s. *Bowlins Lad* 12853, d. *Golden Gamboline* 2nd by *General Light* 12312.
1655 R. N.—ALFRED E. BOND, Wannerton, Kidderminster, for *Italicus*. C.—1655.

Class 206.—Jersey Bulls, born in 1921.

- 1666 I. (215.)—R. BRUCE WARD, Godinton, Ashford, Kent, for *Canterbury Pilgrim* (Vol. 33, p. 148), broken colour, born April 9, 1921; s. *Pilgrim* 13600, d. *Caper* by *Capeicum* 10892.
1665 II. (210.)—LAURENCE E. TUBBS, The Priory, Stevenage, Herts, for *Bowlins Bright Prince*, whole colour, born May 11, 1921, bred by J. E. Quereux, St. Peter, Jersey; s. *Swiss Bright Prince* 5716, d. *Princes Bowlins* 2nd (26740) by *Little Lucile* 3499.
1660 III. (25.)—MRS. G. J. ALSTON, Ellern Mele, Fotheridge, Herts, for *Feather Knights Gamboge*, whole colour, born Aug. 4, 1921, bred by G. A. Meservy, Trinity, Jersey; s. *Commander Gamboge* (5643), d. *King Wing* (21562) by *Feather Knight* (4951).
1662 R. N.—S. G. HODGE, Springhouse Park, Theydon Bois, Essex, for *Marigold's Fleece*.

¹ Prizes given by the English Guernsey Cattle Society.

² Champion Prize of £5 given by the English Guernsey Cattle Society for the best Cow or Heifer in Classes 202 and 204.

³ Champion Prize of £5 given by the English Jersey Cattle Society for the best Bull in Classes 205-207.

Class 207.—Jersey Bulls, born in 1922.¹

- 1680 I. (£15.)—R. BRUCE WARD, Godinton, Ashford, Kent, for *My Pilgrim*, whole colour, born May 7; s. *Pilgrim* 13699, d. *Mistress Mine* (Vol. 32, p. 146) by Masterman of Oaklands 13020.
 1689 II. (£10.)—MRS. BERTRAM CARTER, Bentworth Lodge, Alton, Hants, for *Wotton Glamour*, broken colour, born April 15, bred by Mrs. Evelyn, Wotton House, Dorking; s. *Hicburly Moonlight* 13301, d. *Wotton Pluk May* (Vol. 30, p. 400) by *Red Cloud* 11818.
 1675 III. (£5.)—J. H. N. ROBERTS, Weybeards Farm, Harefield, Middlesex, for *Cowslip's You'll Do*, whole colour, born April 30; s. *General Cowslip* 10960, d. *Quaintness* (Vol. 22, p. 432) by *Kingsway* 12041.
 1679 R. N.—MRS. HAYES SADLER, Nonsbury, Sutton Scotney, for *Pioneer's Footprint*.
 H. C.—1674.

Class 208.—Jersey Cows, in-milk, born in or before 1919.

- 1694 I. (£15, Champion,* & Special.†)—MRS. EVELYN, Wotton House, Dorking, for *Wotton Pink May* (Vol. 30, p. 400), broken colour, born July 25, 1916, calved May 19, 1923; s. *Red Cloud* 11818, d. *Lady May* by *Royal Reward* 9413.
 1693 II. (£10, R. N. for Champion* & R. N. for Special.†)—MRS. EVELYN, for *Wotton Margaret* (Vol. 28, p. 364), whole colour, born June 13, 1914, calved May 10, 1923; s. *Yeovil Lad* 10833, d. *Wotton Daisy Noble* by *Pavillons Noble* 10035.
 1702 III. (£5.)—MRS. HAYES SADLER, Nonsbury, Sutton Scotney, for *Tiny Spots* (Vol. 32, p. 465), whole colour, born Oct. 29, 1917, calved April 30, 1923, bred by P. J. GAVEY, Jersey; s. *Golden Fern's Dairyman* 12340, d. *Dairy Spots* (23370) by *Dairymaid's Arie* 12263.
 1688 R. N.—R. W. CARSON, Halse, Brackley, for *Lynn's Fern Lady* 2nd.
 H. C.—1684, 1685, 1698, 1701, 1705, 1706. C.—1704, 1707.

Class 209.—Jersey Heifers, in-milk, born in 1920.¹

- 1711 I. (£15, & R. N. for Special.†)—MRS. EVELYN, Wotton House, Dorking, for *Wotton Reg Meg*, whole colour, born April 29, calved April 11, 1923; s. *Red Cloud* 11818, d. *Wotton Margaret* (Vol. 28, p. 364) by *Yeovil Lad* 10833.
 1730 II. (£10.)—R. BRUCE WARD, Godinton, Ashford, Kent, for *Pironette* (Vol. 32, p. 116), whole colour, born April 8, calved June 6, 1923; s. *Prometheus* 13391, d. *Caper* by *Capsicum* 10892.
 1708 III. (£5.)—R. W. CARSON, Halse, Brackley, for *Crystal Violet* (Vol. 32, p. 31), broken colour, born May 20, calved June 1, 1923, bred by the late J. CARSON, King's Suite Manor; s. *Sybil's Oxford Majesty* 13769, d. *Silver Violet* 2nd by *The Old* 15473.
 1715 R. N.—J. H. N. ROBERTS, Weybeards Farm, Harefield, Middlesex, for *Duchess of Camille* 4th.
 H. C.—1717. C.—1710, 1714.

Class 210.—Jersey Heifers, in-milk, born in 1921.¹

- 1725 I. (£15, & Special.†)—MRS. EVELYN, Wotton House, Dorking, for *Wotton Queen of Clubs*, whole colour, born March 24, calved April 23, 1923; s. *Acers Prince* 13406, d. *Wotton Margaret* (Vol. 28, p. 364) by *Yeovil Lad* 10833.
 1723 II. (£10.)—R. W. CARSON, Halse, Brackley, for *Persian Girl* 4th, fawn, born March 16, calved June 9, 1923, bred by L. BULLSON, St. Johns, Jersey; *Jersey Volunteer* 5354, d. *Persian Girl* (22161).
 1733 III. (£5.)—J. H. N. ROBERTS, Weybeards Farm, Harefield, Middlesex, for *Sybil's Golden Fern* (Vol. 33, p. 117), whole colour, born May 30, calved June 10, 1923; s. *Sybil's Fair Prince* 14132, d. *Noble Fern Maracas* (Vol. 31, p. 357) by *Golden Fern's Noble* 10923.
 1721 R. N.—MAJOR C. J. BALFOUR, Newton Don, Kelso, for *Celade*.
 H. C.—1731, 1732.

Class 211.—Jersey Heifers, born in 1922.

- 1743 I. (£15.)—MRS. EVELYN, Wotton House, Dorking, for *Wotton Ozone*, whole colour, bred Aug. 12; s. *Wotton Airman* 14174, d. *Wotton Sea Pluk* (Vol. 34) by *Wotton Sandy* 12514.
 1741 II. (£10.)—MRS. BERTRAM CARTER, Bentworth Lodge, Alton, Hants, for *Dorothy*, whole colour, born April 23, bred by the late Lt.-Col. the Hon. H. G. HENDERSON, C.V.O., *Harwood Park*, Faringdon; s. *Dandy* 12897, d. *Dolly* (Vol. 33, p. 309) by *Kilmore Noble* 11745.
 1763 III. (£5.)—R. BRUCE WARD, Godinton, Ashford, Kent, for *Prattler*, whole colour, born May 30; s. *Premier* 14085, d. *Rattler* (Vol. 32, p. 437) by *Malden's General* 12830.
 1749 R. N.—J. PIERPONT MORRIS, Wall Hall, Aldenham, Herts, for *Aldenham Princess Gauntlet*.
 H. C.—1750, 1751.

¹ Prizes given by the English Jersey Cattle Society.

* Champion Prize of £5 given by the English Jersey Cattle Society for the best Cow or Heifer in Classes 205-211.

† Special Prize of £10 given by the English Jersey Cattle Society for the best Cow or Heifer in Class 208, bred by Exhibitor and sired in Great Britain or Ireland.

‡ Special Prize of £10 given by the English Jersey Cattle Society for the best Heifer in Classes 203 and 210, bred by Exhibitor and sired in Great Britain or Ireland.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. xviii

Kerries.

N.B.—In the Kerry Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Irish Kerry Herd Book. A number without brackets indicates that the animal is registered in the English Kerry Herd Book.

Class 212.—Kerry Bulls, born in or before 1921.

- 1753 I. (215, & R. N. for Champion.)¹—CAPT. NELSON ZAMBRA, M.C., and C. WILLIAMSON-MILNE, West Tisted Manor, Ropley, Hants, for Valencia Samson 535, born April 22, 1921, bred by the Knight of Kerry, Valencia Island; s. *Osar* of Carton 506, d. Valencia Fina (4285) by Valencia Chief (355).
- 1756 II. (210).—THEOSOPHICAL EDUCATIONAL TRUST (IN Gt. BRITAIN AND IRELAND), LTD., Camp Farm, Wimbledon Common, for Drop Prince 397, born July 19, 1918, bred by Capt. R. E. Palmer, Oaklands Park, Newdigate, Surrey; s. Mangerton Gortmore Drops 361, d. Gort Primrose 11th 1959 by Gort Prince 2nd 718.
- 1754 III. (25.)—LADY FITZGERALD, Buckland House, Faringdon, for Buckland Viking 470, born April 23, 1920, bred by L. Currie, Minley Manor, Farnborough; s. Minley Alexander 479, d. Minley Audrey 2281 by Minley Mars 362.
- 1757 R. N.—JOHN W. TOWLER, Wadlands Hall, Farsley, Leeds, for Valencia Beaver.

Class 213.—Kerry Bulls, born in 1922.²

- 1760 I. (215.)—LADY FITZGERALD, Buckland House, Faringdon, for Buckland Thor, born June 15; s. Buckland Viking 470, d. Walton Jonquil 4th 1521 by Walton Chamber 234.
- 1763 II. (210).—CAPT. NELSON ZAMBRA, M.C., and C. WILLIAMSON-MILNE, West Tisted Manor, Ropley, Hants, for Hattingley Archibald, born May 30; s. Waterville Lord 424, d. Buckland Bobbin 2532 by Valencia Desmond 352.
- 1761 III. (25.)—JOHN W. TOWLER, Wadlands Hall, Farsley, Leeds, for Wadlands Aired, born May 27; s. First Flight of Carton 474, d. Vaddy Drave 2500 by Vaddy Burntcollet 7th 418.

Class 214.—Kerry Cows, in-milk, born in or before 1919.

- 1769 I. (215, & Champion.)¹—JOHN W. TOWLER, Wadlands Hall, Farsley, Leeds, for Wadlands Flora 2325, born Sept. 22, 1916, calved June 16, 1923, bred by Richard Proctor, Worsdon, Clitheroe; s. Pendle Herdall 329, d. Gort Flora 4th 1578 by Gort Prince (636).
- 1764 II. (210).—ELMHURST FARMING & TRADING CO., LTD., Elmhurst Farm, Sinfold, Sussex, for Gort Curley 8th 2140, born May 14, 1915, calved March 6, 1924, bred by D. M. Rattra; s. Gortmehsky, Ballybunion, Co. Kerry; s. Gort Prince 2nd (718), d. Gort Curley (3356) by Gort Desmond (546).
- 1770 III. (25.)—CAPT. NELSON ZAMBRA, M.C., and C. WILLIAMSON-MILNE, West Tisted Manor, Ropley, Hants, for Castledough Cowslip 4th 2218, born March 3, 1917, calved May 14, 1923, bred by John Hilliard, Killarney; s. Castledough Bernott 759, d. Castledough Cowslip 3rd 2023 by Castledough Rover (746).
- 1765 R. N.—ELMHURST FARMING & TRADING CO., LTD., for Gort Primrose 11th.
- H. C.—1768.

Class 215.—Kerry Heifers, in-milk, born in 1920 or 1921.

- 1774 I. (215).—THEOSOPHICAL EDUCATIONAL TRUST (IN Gt. BRITAIN AND IRELAND), LTD., Camp Farm, Wimbledon Common, for Starlight of Warren (Vol. 21, p. 10), born Sept. 29, 1920, calved April 20, 1923, bred by Muriel Countess De la Warr, Warren Farm, Wimbledon Common; s. Drop Prince 397, d. Buckhurst Primrose 2352 by Minley Baron 347.
- 1776 II. (210).—JOHN W. TOWLER, Wadlands Hall, Farsley, Leeds, for Wadlands Fanny (Vol. 21, p. 15), born Sept. 21, 1920, calved May 18, 1923; s. Valencia Harold 494, d. Flora of Carton 2373 by Prince 6th of Carton (771).
- 1773 III. (25.)—THEOSOPHICAL EDUCATIONAL TRUST (IN Gt. BRITAIN AND IRELAND), LTD., for Grumble of Warren (Vol. 21, p. 11), born Nov. 29, 1920, calved April 26, 1923, bred by Muriel Countess De la Warr, Warren Farm, Wimbledon Common; s. Drop Prince 397, d. Buckhurst Playmate 2351 by Minley Baron 347.
- 1771 R. N.—THE MARCHIONESS OF LONDONDERRY, Wynyard Park, Stockton-on-Tees, for Springfield Figwort.
- H. C.—1777.

Class 216.—Kerry Heifers, not in milk, born in 1921 or 1922.²

- 1782 I. (215).—LADY FITZGERALD, Buckland House, Faringdon, for Buckland Viceta, born April 6, 1922; s. Buckland Viking 470, d. Buckland Joybell (Vol. 20, p. 8) by Minley Victory 408.
- 1779 II. (210).—ELMHURST FARMING & TRADING CO., LTD., Elmhurst Farm, Sinfold, Sussex, for Elmhurst Barberry, born May 30, 1922; s. Mangerton Dermot 3rd 388, d. Shuen-an-sweep 2183 by Oaklands Raspberry 340.
- 1780 III. (25.)—ELMHURST FARMING & TRADING CO., LTD., for Elmhurst Bacchante, born June 25, 1922; s. Primrose Watersheen 416, d. Gort Primrose 11th 1959 by Gort Prince 2nd (718).
- 1781 R. N.—LADY FITZGERALD, for Buckland Bronie.
- H. C.—1783, 1786, 1788.

¹ Silver Challenge Cup, value Twenty-five Guineas, given by the English Kerry and Dexter Cattle Society for the best animal in Classes 212-216.

² Prizes given by the English Kerry and Dexter Cattle Society.

Dexters.

N.B.—In the Dexter Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Irish Dexter Herd Book. A number without brackets indicates that the animal is registered in the English Dexter Herd Book.

Class 217.—Dexter Bulls, born in or before 1921.

- 1790 I. (£15, Champion,¹ & Champion.²)—MRS. FRANK ATHERTON BROWN, Bourton Hill House, Moreton-in-Marsh, Glos, for Bourton Hill Jack 718, born April 19, 1920; s. La Mancha Tiny Tim 668, d. La Mancha Well-Well 2648 F.S.
 1793 II. (£10.)—LADY KATHLEEN HARE, Brockenhurst Park, Brockenhurst, Hants, for Brockenhurst Philip 724, born March 18, 1921; s. Brockenhurst Morilla 651, d. Peach Blossom of Claragh 2635 by Gort Ned 6th (607).
 1791 III. (£25.)—MRS. FRANK ATHERTON BROWN, for Bourton Hill Punch (Vol. 22, p. 110; born Nov. 23, 1921; s. La Mancha Tiny Tim 668, d. La Mancha Wendy 2649 F.S.
 1795 R. N.—THEO. A. STEPHENS, Hookstile House, South Godstone, Surrey, for Hever, Bex, H. C.—1794.

Class 218.—Dexter Bulls, born in 1922.³

- 1797 I. (£15.)—W. LINDSAY EVERARD, Ratcliffe Hall, Leicester, for Fillongley Forest Footpad, born Feb. 21, bred by Mrs. Nutt, Hampton-in-Arden; s. Fillongley Forester 620, d. Fillongley Felicity 2828 by Oakridge Marston Jack 512.
 1798 II. (£10.)—LADY KATHLEEN HARE, Brockenhurst Park, Brockenhurst, Hants, for Brockenhurst Pete, born July 10; s. Brockenhurst Morilla 651, d. Brockenhurst Peach Blossom 2nd 5708 by Brockenhurst Rufus 601.
 1796 III. (£25.)—EDWARD DAVIES, Oaklands, Brecon, for Pontarfran Pasha, born Aug. 2; s. Bagendon Senator 642, d. Cowbridge Dainty Annie 2734 by Cowbridge Dainty Jack 600.
 1802 R. N.—THEO. A. STEPHENS, Hookstile House, South Godstone, for Quernmore Hookstile.
 H. C.—1799, 1800.

Class 219.—Dexter Cows, in-milk, born in or before 1919.

- 1805 I. (£15, R. N. for Champion,¹ & R. N. for Champion.²)—W. LINDSAY EVERARD, Ratcliffe Hall, Leicester, for Fillongley Parola 2487, born Oct. 23, 1917, calved June 4, 1923, bred by Mrs. Nutt, Hampton-in-Arden; s. General Manager 523, d. Dewberry 2239 by Sloeberry 494.
 1808 II. (£10.)—ALFRED C. KING, Braishfield Manor, Romsey, Hants, for La Mancha Maid-lane 2272, born in March, 1913, calved May 15, 1923, breeder unknown.
 1806 III. (£25.)—W. LINDSAY EVERARD, for Fillongley Favourite 2242, born in 1914, calved May 9, 1923, breeder unknown.
 1807 R. N.—LADY KATHLEEN HARE, Brockenhurst Park, Brockenhurst, Hants, for Peach Blossom of Claragh.
 H. C.—1801, 1806.

Class 220.—Dexter Heifers, in-milk, born in 1920 or 1921.

- 1815 I. (£15.)—ALFRED C. KING, Braishfield Manor, Romsey, Hants, for Braishfield Black Tulip 2851, born Sept. 28, 1920, calved March 16, 1923; s. Black Mask 643, d. Braishfield Bloom 2300 by Home Rule 563.
 1810 II. (£10.)—THE TRUSTEES OF ARLEY ESTATE, Arley Estate Office, Northwich, for Fillongley Patsan (Vol. 21, p. 78), born May 28, 1920, calved March 30, 1923, bred by Mrs. Nutt, Hampton-in-Arden; s. Oakridge Scout 674, d. Fillongley Fathom 2414 F.S.
 1813 III. (£25.)—W. LINDSAY EVERARD, Ratcliffe Hall, Leicester, for Fillongley Forest Flower (Vol. 21, p. 78), born Sept. 9, 1920, calved April 26, 1923, bred by Mrs. Nutt, Hampton-in-Arden; s. Fillongley Forester 630, s. Fillongley Fresla 2491.
 1812 R. N.—W. LINDSAY EVERARD, for Brockenhurst Pansy.
 H. C.—1814, 1815.

Class 221.—Dexter Heifers, not in milk, born in 1921 or 1922.³

- 1825 I. (£15.)—THEO. A. STEPHENS, Hookstile House, South Godstone, Surrey, for Hookstile Titania, born Feb. 18, 1922; s. Bagendon Nonsuch 687, d. Lady Eva 2643 F.G.
 1821 II. (£10.)—LADY KATHLEEN HARE, Brockenhurst Park, Brockenhurst, Hants, for Brockenhurst Penelope, born April 3, 1922; s. Brockenhurst Morilla 651, d. Harts' Penelope 1768 by Kingwood Countess Roy 264.
 1819 III. (£25.)—EDWARD DAVIES, Oaklands, Brecon, for Pontarfran Patricia, born April 22, 1922; s. Pontarfran Riffennan 753, d. Pontarfran-Patti 2795 by Brockenhurst Coy 149 539.
 1823 R. N.—MRS. C. L. PICKARD, Middle Brow Top, Quernmore, Lancaster, for Quernmore Rose.
 H. C.—1820, 1824.

¹ Silver Challenge Cup, value Twenty-five Guineas, given by the English Kerry and Dexter Cattle Society for the best animal in Classes 217-221.

² Silver Challenge Brooders Bowl, value Ten Guineas, given through the English Kerry and Dexter Cattle Society for the best animal in Classes 217-221, which is already registered in the English Kerry and Dexter Herd Book, and is the progeny of sire and dam already registered.

³ Prizes given by the English Kerry and Dexter Cattle Society.

Milk Yield Classes.

Class 222.—*Dairy Shorthorn Cows or Heifers.*

- 914 I. (£15, & R. N. for Champion.)—MAJOR S. P. YATES, Broughton Grange, Banbury, for *Foggathorpe Primrose* (Vol. 62, p. 1136), red and little white, born Sept. 5, 1915, calved May 25, 1923, bred by J. Timberlake, Hasloe Farm, Tring; s. Imperial Furbelow 120866, d. Prospect by Dreadnought 102040.
- 930 II. (£10.)—CAPT. THE HON. E. A. FRZROY, M.P., Fox Hill, West Haddon, Rugby, for *Carlton Queen 7th* (Vol. 59, p. 1076), white, born April 15, 1912, calved June 5, 1923, bred by John Wood, The Beeches, Carlton, Carlisle; s. Bright Mindean 104872, d. Fairy Queen by Baron's Pride 80456.
- 909 III. (£5.)—J. M. STUCKLAND, Baines, Catterick, for *Keyingham Tulip 6th* 19006, white, born Aug. 21, 1915, calved June 12, 1923, bred by J. Tuton, Marsh House, Keyingham; s. Graudie 116670, d. Keyingham Tulip 5th by Dransley's Aristocrat 107089, H. C.—912, 918, 922, 925, 934, 951, 954.

Class 223.—*Non-Pedigree Dairy Shorthorn Cows or Heifers.*

- 981 I. (£15.)—JAMES BATTEN & SON, for *Stella*. (See Class 124.)
- 982 II. (£10.)—C. J. BECHTNER, for *Faldo Queen*. (See Class 124.)

Class 224.—*Lincolnshire Red Shorthorn Cows or Heifers.*

- 1002 I. (£15.)—JOHN EVENS & SON, Burton, Lincoln, for *Burton Amy 7th* (Vol. 25, p. 328), born March 14, 1916, calved June 3, 1923; s. Curlicu Nonsuch 10630, d. Burton Amy 2nd by Mr. Profit 4926.
- 1031 II. (£10.)—LT.-COL. SIR A. G. WINGALL, K.C.M.G., Petwood, Woodhall Spa, for *Sibsey Rose* (Vol. 28, p. 484), born Sept. 4, 1915, calved April 18, 1923, bred by A. H. Newton, Sibsey, Boston, Lincs; s. Croft Somerby Conn 7486, d. by Thornton Harry 5665.
- 1020 III. (£5.)—STANLEY BLUNDELL, Bandish House, Welwyn, for *Bandish Cherry 2nd* (Vol. 22, p. 325), born June 1, 1915, calved May 31, 1923; s. Canwick Benedict 15th 6727, d. Bandish Cherry by Crimson Boy 4772, H. C.—1010, 1023, 1024, 1025, 1032.

Class 225.—*South Devon Cows or Heifers.*

- 1129 I. (£15.)—WALTER HUNT, Tracey's Farm, Derry Pomeroy, Totnes, for *Milkmaid 9th* 16797, born Sept. 2, 1916, calved March 29, 1923, bred by W. S. Harris, Stoke Gabriel, Totnes; s. Well Champion 5210, d. Milkmaid 4th 11644 by Duhlia Hero 2887.

Class 226.—*Red Poll Cows or Heifers.*

- 1217 I. (£15.)—THE EXORS. OF THE LATE LORD MANTON, Sudbourne Hall, Orford, Suffolk, for *Gressenhall Red Berry* 23568, born July 14, 1911, calved May 25, 1923, bred by J. E. Hill, Gressenhall, East Dereham; s. Gressenhall Beresford 10174, d. Strawberry 3rd by Edgar 8969.
- 1210 II. (£10.)—LT.-COL. SIR MENRIK R. BURRELL, BT., C.B.E., Knapp Castle, Horsham, for *Sudbourne Minerva* 24373, born Nov. 20, 1913, calved May 6, 1923, bred by Kenneth M. Clark, Sudbourne Hall, Orford; s. Acton Crowfoot 9987, d. Sudbourne Minnie 22850 by Sudbourne Royal 9979.
- 1223 III. (£5.)—CAPTAIN ALAN RICHARDSON, Seven Springs, Cheltenham, for *Tivethall Lena* 24562, born Sept. 11, 1914, calved Feb. 12, 1923, bred by G. Jacques, Ipswich; s. Rendisham Traveller 10785, d. Bredfield Lena 21574 by Rendisham Wonder 9156, H. C.—1211, 1213, 1214, 1221.

Class 227.—*British Friesian Cows or Heifers.*

- 1462 I. (£15, & Champion.)—G. HOLT THOMAS, North Dean House, Hinghamen, High Wycombe, for *Kingswood Myrtle Leaf* 23220, born Nov. 10, 1916, calved June 15, 1923, bred by Horace Hale, Kingswood, Tandridge; s. Kingswood (imported) Ynte 4047, d. Kingswood Myrtle 9294 by Kingswood Prince 341. (See Class 191.)
- 1461 II. (£10.)—G. HOLT THOMAS, for *Kingswood Ceres Myrtle*. (See Class 191.)
- 1455 III. (£5.)—GILBERT & WOODFIELD, Weston Hall, Weston-on-Trent, Derby, for *Swarkestone Beauty* 26676, born Sept. 27, 1916, calved April 24, 1923, bred by A. Handley, Shelton, Derby; s. Osmaston (imported) Frita 4293, d. Terling Lady Gaddy 2nd 16182 by Terling Hermit's Boy 707, H. C.—1446, 1461, 1467, 1473, 1500.

¹ Champion Prize of £30, with £5 to the Reserve Number, given by a Society interested in the production of milk, for the Cows obtaining the highest number of points in the Dairy Shorthorn, Lincolnshire Red Shorthorn, South Devon, Red Poll, and British Friesian Milk Yield Competitions.

c Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.

Class 228.—Ayrshire Cows or Heifers.

- 1592 I. (£15).—A. & A. KIRKPATRICK, Barr, Sanguhar, for *Auchenbay Meg* 68938, born Feb. 15, 1918, calved June 15, 1923, bred by James Ferguson, Auchenbay; s. *Auchenbay Fire Boy* 17764, d. *Auchenbay Highland Mary* 4th A1491 by *Howie's Sir William* 1096.
 1602 II. (£10).—F. H. SANDERSON, Eshott Home Farm, Felton, Northumberland, for *Newlands Sunbeam* 70748, born Jan. 17, 1918, calved April 24, 1923, bred by C. H. Sanderson, Newlands, Belford, Northumberland; s. *Braw Lad* 15721, d. *Broadmoor Sunbeam* 2nd 39051 by *Knocketta Coronation* 8740.
 1585 III. (£5).—WILLIAM L. FERGUSON, Catlins, Lockerbie, for *Archwood Nan* 72488, born March 20, 1916, calved April 4, 1923, bred by M. Aird, Archwood, Lockerbie; s. *Archwood Harry* 10651, d. *Archwood Bell* 2nd A. 8577 by *Archwood Chief* 9516.
 H. C.—1586, 1588, 1587, 1588, 1609.

Class 229.—Guernsey Cows or Heifers.

- 1636 I. (£15, & Champion).—SIR JAMES REMNANT, Bt., M.P., The Grange, Hare Hatch, Twyford, Berks, for *Princess of Cailloterie* 10257, fawn and white, born March 7, 1912, calved June 4, 1923, bred by F. N. Mahy, Osmonds, St. Sampsons, Guernsey; s. *Governor of the Chene* 1297 P.S., R.G.A.S., d. *Lafida* 14th 6219 P.S., R.G.A.S.
 1630 II. (£10, & R. N. for Champion).—A. CHESTER BEATTY, Calchill Park, Little Chart, Kent, for *Lizette of St. Catherine* 18718, fawn and white, born June 20, 1918, calved April 11, 1923, bred by P. C. Robilliard, St. Catherine, St. Peter Port, Guernsey; s. *Lively Sailor Boy* of Les Quartiers 3622 P.S., R.G.A.S., d. *Maypole* 6th 8582 P.S., R.G.A.S.
 1637 III. (£5).—G. P. SANDAY, Puddington Hall, Neston, Cheshire, for *Downe Landes Beauty* 2nd 13445, fawn and white, born Sept. 2, 1917, calved June 18, 1923, bred by J. B. Ingrouille, Les Landes, Forest, Guernsey; s. *Braye Duke* 3704 P.S., R.G.A.S., d. *Land's Beauty* 15248 P.S., R.G.A.S., by *Governor of the Corbinex* 3802 P.S., R.G.A.S.
 H. C.—1632.

Class 230.—Jersey Cows or Heifers.

- 1692 I. (£15, & Special).—MRS. EVELYN, Wotton House, Dorking, for *Fairlawne Hussey* (Vol. 30, p. 273), broken colour, born Aug. 8, 1916, calved Jan. 11, 1923, bred by W. M. Cazalet, Fairlawne, Tonbridge; s. *Sir Toby* 12154, d. *Hussy* 13th by *MacDongal* 9333.
 1703 II. (£10, & R. N. for Special).—LAURENCE E. TUBBS, The Priory, Stevenage, for *Onix* (Vol. 33, p. 397), whole colour, born July 23, 1919, calved March 18, 1923, bred by Dr. Watney, Buckhold, Reading; s. *Lord Primrose* 12601, d. *Gem's Maple* by *Violante* Gem 12178.
 1707 III. (£5).—R. DRUCE WARR, Godinton, Ashford, Kent, for *Miranda's Lass* (Vol. 33, p. 384), whole colour, born Nov. 5, 1919, calved Jan. 26, 1923; s. *Marionette's Lad* 13351, d. *Fairlawne Miranda* by *Sir Toby* 12154.
 H. C.—1684, 1684, 1686, 1698, 1701, 1705, 1715.

Class 231.—Kerry Cows or Heifers.

- 1764 I. (£15, & Champion).—THE ELMHURST FARMING & TRADING CO., LTD., for *Gort Curley* 9th. (See Class 214.)
 1767 II. (£10).—JOHN W. FOWLER, Wadlands Hall, Parsley, Leeds, for *Wadlands Buttermilk* 2523 F.S., born in 1912, calved June 17, 1923, breeder unknown.
 1765 III. (£5).—THE ELMHURST FARMING & TRADING CO., LTD., for *Gort Primrose* 11th 1359, born Jan. 24, 1916, calved June 1, 1923, bred by D. M. Rattray, Gortnaskeagh, Ballybunion, Co. Kerry; s. *Gort Prince* 2nd (718), d. *Gort Primrose* 8th (3855) by *Gort Peter* (688).
 H. C.—1760, 1771.

Class 232.—Dexter Cows or Heifers.

- 1808 I. (£15, & R. N. for Champion).—ALFRED C. KING, for *La Mancha Madeline*. (See Class 219.)
 1806 II. (£10).—W. T. EVERARD, for *Filongley Favourite*. (See Class 219.)
 1809 III. (£5).—MRS. C. L. PICKARD, Middle Brow Top, Quernmore, Lancaster, for *Gort Primula* 7th 2027, born April 24, 1916, calved June 9, 1923, bred by D. M. Rattray, Gortnaskeagh, Ballybunion, Co. Kerry; s. *Gort Ned* 8th 631, d. *Gort Primula* 6th (2342) by *Gort Punch* 3rd (592).
 H. C.—1804, 1814.

¹ Champion Prize of £20, with £5 to the Reserve Number, given by a Society interested in the production of milk, for the Cows obtaining the highest number of points in the Ayrshire, Jersey and Guernsey Milk Yield Competitions.

² Special Prize of £10 10s. given by the Royal Jersey Agricultural Society for the Jersey Cow in Class 230 obtaining the greatest number of points.

³ Champion Prize of £10, with £3 to the Reserve Number, given by a Society interested in the production of milk, for the Cows obtaining the highest number of points in the Kerry and Dexter Milk Yield Competitions.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. ci

Butter Tests.

Class 233a.—Cows exceeding 900 lbs. live weight.

- 1009 I. (215.)—JOHN EVENS & SON, for Burton Amy 7th. (See Class 224.)
 1481 II. (210.)—G. HOLT THOMAS, for Kingswood Ceres Myrtle. (See Class 191.)
 1692 III. (25, & G.M.)—MRS. EVELYN, for Fairlawne Hussy. (See Class 230.)
 1764 (G.M.)—THE ELMHURST FARMING & TRADING CO., LTD., for Gort Curley 9th.
 H. C.—899, 912, 918, 914, 922, 1020, 1024, 1025, 1032, 1129, 1223, 1530, 1587, 1637.

Class 233b.—Cows not exceeding 900 lbs. live weight.

- 1703 I. (215, & S.M.)—LAURENCE E. TURNER, for Oxlip. (See Class 230.)
 1686 II. (210.)—MRS. CARRY BRIGGS, The Grange, North Stoke, Wallingford, for Lily of the Valley (Vol. 30, p. 318), whole colour, born Oct. 26, 1917, calved April 25, 1923, bred by Mrs. Cottrell-Dormer, Coombe, Woodstock; s. King Primrose 12674, d. Golden Primrose by Rosy's Golden Champion 11523.
 1707 III. (25.)—R. BRUCE WARD, for Miranda's Lass. (See Class 230.)
 1705 (B.M.)—R. BRUCE WARD, for Ida.
 1698 (Certificate of Merit.)—MISS MARJORIE HENDERSON, for Gloria June.

GOATS.*

Class 235.—Female Goats, Toggenburg, entered or eligible for entry in the Toggenburg section of the Herd Book, over 2 years old.

- 1827 I. (23.)—MISS MARJORIE HENDERSON, The Riding, Hexham, for Riding Cherry 412, born March 9, 1919, kidded June 8; s. Brendon Friday 349, d. Riding Crocus 367 by Sedgemere Paris 2nd.
 1530 II. (22.)—MRS. PERCY WAINWRIGHT, Sheepwalks, Pontefract, for Ballywalter Sarah 356, born April 11, 1916, kidded April 29, 1923, bred by Lady Dunleath, Ballywalter Castle, Co. Down, Ireland; s. Sedgemere Paris 2nd 292, d. Halton Hagar 248.
 1829 III. (21.)—MRS. STRAKER, Stagshaw, Corbridge, for Leazes Hackee T. 433, born Feb. 15, 1920, kidded April 1, 1923; s. Brendon Friday 349, d. Leazes Hackberry 804 by Cophthorne Billiken 274.

Class 236.—Female Goats, British Alpine, over 2 years old.

- 1831 I. (23.)—MISS G. CHAMBERLAIN, Westons, Lyndhurst, Hants, for Wanton of Westons 4639, born Jan. 20, 1921, kidded April 19, 1923; s. Proud 2853, d. Hilma by Stockwell Grange 4566.

Class 237.—Female Goats, Saanen or British Saanen, over 2 years old.

- 1838 I. (23.)—MISS G. CHAMBERLAIN, Westons, Lyndhurst, Hants, for Welfare of Westons 4640, British Saanen, born Jan. 20, 1921, kidded April 4, 1923; s. Proud 2853, d. Hilma by Stockwell Grange 4566.
 1839 II. (22.)—MRS. HINES, Watley, Twyford, Winchester, for Grietze S.14, born in 1919, breeder unknown, kidded March 10, 1923.
 1835 III. (21.)—MISS CECILY BOOTH, Yorecroft, Ripon, for Frida S.10, breeder and age unknown, kidded March 18, 1923.
 1835 R. N.—MISS CECILY BOOTH, for Effloaty.

Class 238.—Female Goats, Anglo-Nubian, entered or eligible for entry in the Anglo-Nubian section of the Herd Book, over 2 years old.

- 1845 I. (23.)—MISS K. PELLY, Theydon Place, Epping, Essex, for Theydon Angela 1303, born May 6, 1920, kidded May 7, 1923; s. Sadberge Marcus Coriolanus 1003, d. Regius Aganippe 895 by Wigmore Norman 562.
 1847 II. (22.)—MISS K. PELLY, for Nash Bellona 1275, born March 25, 1920, kidded June 6, 1923, bred by W. Horne, Nash Court, Westwell, Kent; s. Edenbreck Danaus 843, d. Nash Della 1112 by Edenbreck Midas 740.
 1846 III. (21.)—MISS K. PELLY, for Theydon Annette 1304, born May 6, 1920, kidded May 16, 1923; s. Sadberge Marcus Coriolanus 1003, d. Regius Aganippe 895 by Wigmore Norman 562.
 1844 R. N.—MRS. REGINALD PEASE, Sledwich, Barnard Castle, for Sadberge Wrynneck. H. C.—1850. C.—1812.

* Gold Medal, Silver Medal, and Bronze Medal given by the English Jersey Cattle Society for the three Jersey Cows obtaining the greatest number of points in the Butter Tests.

* Gold Medal given by the English Kerry and Dexter Cattle Society for the Kerry Cow obtaining the greatest number of points in the Butter Tests.

* Certificate of Merit given by the English Jersey Cattle Society for Jersey Cows, not being Prize Winners, obtaining the following points: Cows five years old and upwards, 35 points; Cows under five years old, 30 points.

* £30 towards these Prizes were given by the British Goat Society.

cii *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 239.—*Female Goats, any other variety, over 2 years old, not eligible for Classes 235 to 238.*

- 1861 I. (23, & Champion.¹)—MRS. STRAKER, Stagshaw, Corbridge, for *Leazes Fidelia* 4422, cross-bred, born May 9, 1920, kidded May 1, 1923; s. *Leazes Harvest* 388, d. *Leazes Fortuna* 3266 by *Ciceter Hearthstone* 2599.
 1852 II. (22.)—MISS C. CHAMBERLAIN, Westons, Lyndhurst, Hants, for *Wistful of Westons* 4641, British Toggenburg, born Feb. 7, 1921, kidded April 4, 1923; s. *Edenstead Truck* 3007, d. *Fulience of Westons* 4512 by *Champion Proud* 2853.
 1853 III. (21.)—MISS MARJORIE HENDERSON, The Riding, Hexham, for *Riding Tulip* 5730, Anglo-Nubian-Swiss, born April 20, 1919, kidded Feb. 18, 1923; s. *Mayfield Tipptary* 2418, d. *Riding Thistle* 2392 by *Performer* 2552.
 1862 R. N.—MRS. STRAKER, for *Leazes Kidstone*.
 H. C.—1855. C.—1854, 1856, 1858.

Class 240.—*Goatlings, British Alpine or British Toggenburg, over 1 year, but not exceeding 2 years old.*

- 1863 I. (23.)—MISS MARJORIE HENDERSON, The Riding, Hexham, for *Riding Thistle* 2392 5318, British Alpine, born April 8, 1922; s. *Dochfour Onyx* 4665, d. *Riding Thistle* 2392 by *Performer* 2552.
 1864 II. (22.)—MRS. STRAKER, Stagshaw, Corbridge, for *Leazes Kirtle* 5576, British Alpine, born March 24, 1922; s. *Mayfield Prince Charming* 3215, d. *Leazes Kidstone* 2963 by *Ciceter Hearthstone* 2599.

Class 241.—*Goatlings, Anglo-Nubian, entered or eligible for entry in the Anglo-Nubian section of the Herd Book, over 1 but not exceeding 2 years old.*

- 1867 I. (23, & R. N. for Champion.²)—MISS K. PELLY, Theydon Place, Epping, Essex, for *Theydon Babette* 1436, born Jan. 2, 1922; s. *Theydon Angus* 1136, d. *Nash Baroness* 1242 by *Edenbrook Danaus* 843.
 1868 II. (22.)—MISS K. PELLY, for *Theydon Brigette* 1437, born Jan. 2, 1922; s. *Theydon Angus* 1136, d. *Nash Baroness* 1242 by *Edenbrook Danaus* 843.
 1866 III. (21.)—MRS. REGINALD PEASE, Sledwih, Barnard Castle, for *Sadberge Sparrowhawk* 1425, born Jan. 1, 1922; s. *Theydon Aristocrat* 1858, d. *Sadberge Sparrow* 327 by *Bricket Llewellyn* 112.
 1865 R. N.—MRS. REGINALD PEASE, for *Sadberge Hobby*.

Class 242.—*Goatlings, any other variety, over 1 year but not exceeding 2 years old, not eligible for Classes 240 and 241.*

- 1871 I. (23, & Champion.³)—MISS C. CHAMBERLAIN, Westons, Lyndhurst, Hants, for *Wil of Westons* 5247, British Saanen, born March 6, 1922; s. *Horne Bay Thark* 4916, d. *Welcome of Westons* 4513 by *Proud* 2853.
 1875 II. (22.)—MISS K. PELLY, Theydon Place, Epping, Essex, for *Theydon Percie* 5384, Anglo-Nubian-Swiss, born Feb. 16, 1922; s. *Proud* 2853, d. *Copthorne Boubon* 3112 by *Copthorne Brigadier* 2608.
 1873 III. (21.)—MRS. HINES, Watley, Twyford, Winchester, for *Beechmead Snow* 5465, Anglo-Nubian-Swiss, born March 9, 1922; s. *Proud* 2853, d. *Beechmead Kitty* by *Copthorne Brigadier* 2608.
 1872 R. N.—MISS MARJORIE HENDERSON, The Riding, Hexham, for *Riding Titania*.
 H. C.—1874. C.—1869.

Class 243.—*Female Kids, Toggenburg, entered or eligible for entry in the Toggenburg Section of the Herd Book, not exceeding 1 year old.*

- 1878 I. (23.)—MRS. PERCY WAINWRIGHT, Sheepwalks, Pontefract, for *Fryston Sorrel*, born April 29, 1923; s. *Edel* (imported) T.524, d. *Ballywalter Sarah* 356 by *Sedgemere Paris* 2nd 292.
 1876 II. (22.)—MRS. PERCY WAINWRIGHT, for *Fryston Senna*, born April 29, 1923; s. *Edel* (imported) T.524, d. *Ballywalter Sarah* 356 by *Sedgemere Paris* 2nd 292.

Class 244.—*Female Kids, Anglo-Nubian, entered or eligible for entry in the Anglo-Nubian section of the Herd Book, not exceeding 1 year old.*

- 1880 I. (23, & Champion.⁴)—MISS K. PELLY, Theydon Place, Epping, Essex, for *Theydon Belladonna* 1512, born Sept. 15, 1922; s. *Theydon Marconi* 1139, d. *Nash Bella* 1112 by *Edenbrook Midus* 748.
 1881 II. (22.)—MISS K. PELLY, for *Theydon Bettina* 1532, born March 19, 1923; s. *Sadberge Alexander* 1243, d. *Theydon Beauty* 1272 by *Sadberge Marcus Coriolanus* 1003.

¹ Challenge Certificate given by the British Goat Society for the best Female Goat, over 2 years old, that has borne a kid.

² Bronze Medal given by the British Goat Society for the best Goating.

³ Bronze Medal given by the British Goat Society for the best Kid.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. ciii

- 1879 III. (*£1*).—MRS. HENDY, Etherley, Bishop Auckland, for **Sadberge Cockatoo** 1520, born Feb. 5, 1923, bred by Mrs. Reginald Pease, Slodwich, Barnard Castle; *s.* Sadberge Alexander 1248, *d.* Sadberge Cliff Chaff 908 by Sadberge Romulus 738.
 1882 R. N.—MRS. C. L. FICKARD, Middle Brow Top, Quernmore, Lancaster, for **Edenbreck Lark**.

Class 245.—Female Kids, any other variety, not over 1 year old, not eligible for Classes 243 and 244.

- 1891 I. (*£3*, & R. N. for Champion.)—MRS. REGINALD PEASE, Slodwich, Barnard Castle, for **Sadberge Duckling** 5813, born Jan. 20, 1923; *s.* Sadberge Castle 1430, *d.* Sadberge Cygnet by Sadberge Romulus 738.
 1893 II. (*£2*).—MRS. ALEXANDER, Stockwell House, Knarborough, for **Stockwell Lassie** 10127, British-Toggenburg, born Jan. 20, 1923; *s.* Atherstone Generosity 4244, *d.* Stockwell Nancy by Cophurme Bat 2598.
 1897 III. (*£1*).—MISS C. CHAMBERLAIN, Westons, Lyndhurst, Hants, for **Whim of Westons** 10175, Anglo-Nubian-Swiss, born April 4, 1923; *s.* Proud 2853, *d.* Wistful of Westons 4641 by Edenstead Pluck 3007.
 1899 R. N.—MISS MARJORIE HENDERSON, The Riding, Hexham, for **Riding Topaz**.
 H. C.—1894, 1896, 1898.

Class 246.—Group Class, consisting of the Goat and her Female Offspring, entered in Classes 235 to 245, and exhibited by same owner.

- 1856, 1874, 1891 I. (*£3*).—MRS. REGINALD PEASE, Slodwich, Barnard Castle, for **Sadberge Cygnet, Sadberge Gossander and Sadberge Duckling**.
 1896, 1894, 1895 II. (*£2* & Champion.)—MISS Cecily BOOTH, Yarrowcroft, Ripon, for **Frida, Springfield Fidelity and Springfield Frivolity**.
 1862, 1864, 1894 III. (*£1*).—MRS. STRAKER, Stagshaw, Corbridge, for **Leazes Kidstone, Leazes Kilde and Leazes Kluden**.
 1852, 1867 R. N.—MISS C. CHAMBERLAIN, Westons, Lyndhurst, for **Wistful of Westons and Whim of Westons**.
 H. C.—1853 and 1890.

Milk Yield Classes.

Class 247.—Goats that have kidded once.

- 1838 I. (*£3*).—MISS C. CHAMBERLAIN, for **Welfare of Westons**. (See Class 237.)
 1855 II. (*£2*).—MRS. HINES, Watley, Twyford, Winchester, for **Beechmead Dolly** 4724, Anglo-Nubian-Swiss, born Feb. 14, 1921, kidded Feb. 21, 1923; *s.* Edenstead Pluck 3007, *d.* Beechmead Kitty by Cophurme Brigadier 2608.
 1844 III. (*£1*).—MRS. REGINALD PEASE, Slodwich, Barnard Castle, for **Sadberge Wyrneck** 1425, born Dec. 22, 1919, kidded May 6, 1923; *s.* Edenbreck Marcus 933, *d.* Bricket Beryl 622 by Bricket Viking 167.

Class 248.—Goats not eligible for Class 27.

- 1862 I. (*£3*, & Champion.)—MRS. STRAKER, Stagshaw, Corbridge, for **Leazes Kidstone** 2965, cross-bred, born June 26, 1917, kidded March 30, 1923; *s.* Cloeter Heathstone 2599, *d.* Leazes Kiddle 2513 by Leazes Lucky Steyne 1839.
 1827 II. (*£2*, & R. N. for Champion.)—MISS MARJORIE HENDERSON, for **Riding Cherry**. (See Class 235.)
 1252 III. (*£1*).—MISS C. CHAMBERLAIN, for **Wistful of Westons**. (See Class 239.)
 1801 (R. N. & Champion.)—MRS. STRAKER, for **Leazes Fidella**. (See Class 239.)
 1843 (Champion.)—MISS K. Pelly, for **Theridon Angela**. (See Class 238.)
 1847 (R. N. for Champion.)—MISS K. Pelly, for **Nash Bellona**. (See Class 238.)
 H. C.—1839. C.—1830.

¹ Bronze Medal given by the British Goat Society for the best Kid.
² The "Pearson" Challenge Trophy for the best Female Goat and her Kids.
³ The "Dewar" Challenge Trophy, given through the British Goat Society for the Goat entered in either the General or the Toggenburg section of the Society's Herd Book winning the highest number of points in the Milking Classes.
⁴ Challenge Certificate, given by the British Goat Society for the best Local Purpose Goat.
⁵ The "Pomroy" Challenge Cup, given through the British Goat Society for the best Anglo-Nubian entered in the Anglo-Nubian section of the Society's Herd Book winning the highest number of points in the Milking Classes.

civ *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

SHEEP.

Oxford Downs.

Class 249.—*Oxford Down Shearling Rams.*

- 1902 I. (£10), and 1903 R. N.—HUGH W. STILGOS, The Grounds, Adderbury, Banbury.
 1901 II. (£5).—FREDERICK PENSON, Taston, Charlbury, Oxon.
 1900 III. (£3).—WILLIAM TREVELTHAN, Broadstone Hill, Chipping Norton.
 H. C.—1904. C.—1906.

Class 250.—*Oxford Down Ram Lambs.*¹

- 1917 I. (£10).—FREDERICK PENSON, Taston, Charlbury, Oxon.
 1915 II. (£5).—GEORGE HARRISON, Galford Hall, Darlington.
 1919 III. (£3).—W. F. G. WATTS, Eilsfeld, Oxford.
 1911 R. N.—HENRY AKERS & Co., Moat House, Black Bourton, Clanfield, Oxon.
 H. C.—1910. C.—1918.

Class 251.—*Three Oxford Down Ram Lambs.*

- 1923 I. (£10).—MAJOR R. F. FULLER, Great Chalfield, Melksham, Wilts.
 1921 II. (£5).—HENRY AKERS & Co., Moat House, Black Bourton, Clanfield, Oxon.
 1924 III. (£3).—W. R. GANTLETT & SON, Manor Farm, Fairford, Glos.
 1929 R. N.—W. F. G. WATTS, Eilsfeld, Oxford.
 H. C.—1922. C.—1928.

Class 252.—*Three Oxford Down Shearling Ewes.*

- 1932 I. (£10, & Champion.²)—FREDERICK PENSON, Taston, Charlbury, Oxon.
 1930 II. (£5).—CAPTAIN E. G. SPENCER CHURCHILL, M.C., Northwick Park, Blockley, Warks,
 for ewes bred by J. J. HUTTON, Cote House, Banbury, Oxon.
 1933 III. (£3).—HUGH W. STILGOS, The Grounds, Adderbury, Banbury.
 1934 R. N.—WILLIAM TREVELTHAN, Broadstone Hill, Chipping Norton.
 H. C.—1931.

Class 253.—*Three Oxford Down Ewe Lambs.*

- 1936 I. (£10, & R. N. for Champion.³)—HENRY AKERS & Co., Moat House, Black Bourton,
 Clanfield, Oxon.
 1942 II. (£5).—FREDERICK PENSON, Taston, Charlbury, Oxon.
 1939 III. (£3).—W. R. GANTLETT & SON, Manor Farm, Fairford, Glos.
 1945 R. N.—W. F. G. WATTS, Eilsfeld, Oxford.
 H. C.—1940. C.—1938.

Shropshires.

Class 254.—*Shropshire Two Shear Rams.*²

- 1955 I. (£10, Champion,⁴ & Champion.⁵)—E. CRAIG TANNER, Eytton-on-Severn, Cross Houses,
 Salop.
 1950 II. (£5).—THOMAS A. BUTTAR, Corston, Coupar Angus.
 1949 R. N.—H. A. BROWN, Grendon, Atherstone, for Grendon Blackmailer.
 H. C.—1948. C.—1951.

Class 255.—*Shropshire Shearling Rams.*

- 1967 I. (£10, & R. N. for Champion.⁶)—E. CRAIG TANNER, Eytton-on-Severn, Cross Houses,
 Salop, for ram, bred by J. J. Brewin, Llysmeirchlon, Trefnant.
 1964 II. (£5).—NORMAN J. NUSSEBERRY, Fern Hill House, Market Drayton.
 1957 III. (£3).—H. A. BROWN, Grendon, Atherstone.
 1956 R. N.—LT.-COL. E. C. ATKINS, Stretton House, Hinckley.
 H. C.—1960.

¹ Prizes given by the Oxford Down Sheep Breeders' Association.

² The "Heythrop" Silver Challenge Cup, value £76, given through the Oxford Down Sheep Breeders' Association for the best exhibit of Oxford Down Sheep in Classes 249-253.

³ Prizes given by the Shropshire Sheep Breeders' Association.

⁴ Champion Silver Medal given by the Shropshire Sheep Breeders' Association for Goat, over Ram in Classes 254 and 255.

⁵ The "Eaton" Silver Challenge Cup, value Fifty Guineas, given through "Sheep Breeders' Association for the best exhibit of Shropshire Sheep in Class

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. cv

Class 256.—Three Shropshire Shearling Rams.

- 1975 I. (#10).—E. CRAIG TANNER, Eyton-on-Severn, Cross Houses, Salop.
 1968 II. (#5).—LT.-COL. E. C. ATKINS, Stretton House, Hinckley.
 1970 III. (#3).—THOMAS A. BUTTAR, Corston, Coupar Angus.
 1969 R. N.—H. A. BROWN, Grendon, Atherstone.

Class 257.—Three Shropshire Ram Lambs.¹

- 1977 I. (#10).—H. A. BROWN, Grendon, Atherstone.
 1980 II. (#5).—J. G. PEELE, Peover Hall, Knutsford.
 1981 R. N.—E. CRAIG TANNER, Eyton-on-Severn, Cross Houses, Salop.
 H. C.—1979.

Class 258.—Three Shropshire Shearling Ewes.

- 1982 I. (#10, & R. N. for Champion.²).—LT.-COL. E. C. ATKINS, Stretton House, Hinckley.
 1983 II. (#5).—E. CRAIG TANNER, Eyton-on-Severn, Cross Houses, Salop.
 1983 III. (#3).—NORMAN J. NUNNERY, Turn Hill House, Market Drayton.
 1984 R. N.—J. G. PEELE, Peover Hall, Knutsford.

Class 259.—Three Shropshire Ewe Lambs.

- 1986 I. (#10).—H. A. BROWN, Grendon, Atherstone.
 1988 II. (#5).—NORMAN J. NUNNERY, Turn Hill House, Market Drayton.
 1991 III. (#3).—E. CRAIG TANNER, Eyton-on-Severn, Cross Houses, Salop.
 1990 R. N.—J. G. PEELE, Peover Hall, Knutsford.
 H. C.—1988.

Southdowns.

Class 260.—Southdown Two Shear Rams.³

- 1999 I. (#10, & R. N. for Champion.⁴).—LADY LUDLOW, Luton Hoo, Luton, Beds.
 1995 II. (#5).—LADY FITZGERALD, Buckland, Faringdon, Berks.
 1993 III. (#3).—H. M. THE KING, Sandringham, Norfolk.
 1994 R. N.—SIR JEREMIAH COLMAN, BT, Gatton Park, Surrey.
 H. C.—1992, 1993. C.—1997.

Class 261.—Southdown Shearling Rams.

- 2000 I. (#10, & Champion.⁴).—H. M. THE KING, Sandringham, Norfolk.
 2005 II. (#5), and 2006 III. (#3).—LADY LUDLOW, Luton Hoo, Luton, Beds.
 2002 R. N.—LADY FITZGERALD, Buckland, Faringdon, Berks.
 H. C.—2006. C.—2001.

Class 262.—Three Southdown Shearling Rams.³

- 2010 I. (#10).—H. M. THE KING, Sandringham, Norfolk.
 2012 II. (#5).—LADY FITZGERALD, Buckland, Faringdon, Berks.
 2014 III. (#3).—LADY LUDLOW, Luton Hoo, Luton, Beds.
 2011 R. N.—SIR JEREMIAH COLMAN, BT, Gatton Park, Surrey.
 C.—2013.

Class 263.—Three Southdown Ram Lambs.

- 2020 I. (#10).—LADY LUDLOW, Luton Hoo, Luton, Beds.
 2018 II. (#5).—LADY FITZGERALD, Buckland, Faringdon, Berks.
 2016 III. (#3).—SIR JEREMIAH COLMAN, BT, Gatton Park, Surrey.
 2015 R. N.—H. M. THE KING, Sandringham, Norfolk.
 H. C.—2017, 2021. C.—2022.

Class 264.—Three Southdown Shearling Ewes.

- 2024 I. (#10, & Champion.⁴).—SIR JEREMIAH COLMAN, BT, Gatton Park, Surrey.
 2027 II. (#5, & R. N. for Champion.⁴).—LADY LUDLOW, Luton Hoo, Luton, Beds.
 2023 III. (#3).—H. M. THE KING, Sandringham, Norfolk.
 2026 R. N.—J. PIERPONT MORGAN, Wall Hall, Aldenham, Herts.
 H. C.—2029. C.—2025.

¹ Prizes given by the Shropshire Sheep Breeders' Association.
² The "Eaton" Silver Challenge Cup, value fifty guineas, given through the Shropshire breeders' Association for the best exhibit of Shropshire sheep in Classes 254-259, the highest prize given by the Southdown Sheep Society.
³ Challenge for Gold Medal, value £10 10s., given by the Southdown Sheep Society for the best Anglo-Nubian, value £60 and 2s.1.
⁴ Silver Medal given by the Southdown Sheep Society for the best Pen of Ewes highest number in Classes 264 and 265.

cvi *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 265.—Three Southdown Ewe Lambs.

- 2033 I. (**£10**).—LADY FITZGERALD, Buckland, Faringdon, Berks.
 2030 II. (**£5**).—H.M. THE KING, Sandringham, Norfolk.
 2031 III. (**£3**).—SIR JEREMIAH COLMAN, Bt., Gattton Park, Surrey.
 2035 R. N.—LADY LUDLOW, Luton Hoo, Luton, Beds.
 H. C.—2034, 2038. C.—2032, 2036.

Hampshire Downs.

Class 266.—Hampshire Down Shearling Rams.

- 2041 I. (**£10**).—MRS. JERVOISE, Herriard Park, Basingstoke.
 2039 II. (**£5**).—THE HON. LADY HULSE, Breamore, Salisbury.
 2043 III. (**£3**), and 2044 R. N.—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants.
 H. C.—2040. C.—2042.

Class 267.—Hampshire Down Ram Lambs.¹

- 2046 I. (**£10**), and 2047 IV. (**£2**).—H. W. BISHOP and J. W. MEASURES, Pendley Stock Farms, Tring, Herts.
 2055 II. (**£5**).—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants.
 2048 III. (**£3**), and 2049 R. N.—THE HON. LADY HULSE, Breamore, Salisbury.
 H. C.—2050, 2054.

Class 268.—Three Hampshire Down Ram Lambs.

- 2058 I. (**£10**, & R. N. for Champion.²)—THE HON. LADY HULSE, Breamore, Salisbury.
 2059 II. (**£5**).—MRS. JERVOISE, Herriard Park, Basingstoke.
 2061 III. (**£3**).—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants.
 2057 R. N.—H. W. BISHOP and J. W. MEASURES, Pendley Stock Farms, Tring, Herts.
 H. C.—2060.

Class 269.—Three Hampshire Down Shearling Ewes.

- 2063 I. (**£10**), and 2064 II. (**£5**).—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading.
 2065 III. (**£3**).—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants.

Class 270.—Three Hampshire Down Ewe Lambs.

- 2067 I. (**£10**, & Champion.³)—H. W. BISHOP and J. W. MEASURES, Pendley Stock Farms, Tring, Herts.
 2068 II. (**£5**).—THE HON. LADY HULSE, Breamore, Salisbury.
 2070 III. (**£3**).—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading.
 2071 R. N.—V. T. THOMPSON, Norton Manor, Sutton Scotney, Hants.
 H. C.—2069.

Suffolks.³

Class 271.—Suffolk Two Shear Rams.

- 2075 I. (**£10**).—S. R. SHERWOOD, Playford, Ipswich, for Playford Consul.
 2074 II. (**£5**).—G. R. C. FOSTER, Anstey Hall, Trumpington, Cambridge, for Trumpington Drummer 16820.
 2073 III. (**£3**).—R. L. BARCLAY, C.B.E., Highnam, Bury St. Edmunds, for Highnam Quality 2nd 16309.

Class 272.—Suffolk Shearling Rams.

- 2080 I. (**£10**).—G. R. C. FOSTER, Anstey Hall, Trumpington, Cambridge, for Grange Century 2nd, bred by H. E. Smith, Searsons, Trimley.
 2083 II. (**£5**).—S. R. SHERWOOD, Playford, Ipswich.
 2079 III. (**£3**).—G. R. C. FOSTER, for Grange Century, bred by H. E. Smith, Searsons, Trimley.
 2081 R. N.—A. PRESTON JONES, Mickieover House, Derby, for Playford Judicious.
 C.—2076.

¹ Prizes given by the Hampshire Down Sheep Breeders' Association.

² Champion Prize of £10 given by the Hampshire Down Sheep Breeders' Association for the best Ram Lamb, Pen of Ram Lambs or Ewe Lambs in Classes 267, 268 and 270.

³ £42 towards these Prizes were given by the Suffolk Sheep Society.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. cvii

Class 273.—Suffolk Ram Lambs.

- 2089 I. (**£10.**) and 2090 II. (**£5.**)—SIR ERNEST CASSELL'S EXORS., Carlton Grange, Newmarket.
 2094 III. (**£3.**)—G. A. GOODCHILD, The Oak House, Great Yeldham, Essex.
 2105 IV. (**£2.**)—G. BERTRAM SHIELDS, Dolphingstone, Tranent, East Lothian.
 2104 R. N.—S. R. SHERWOOD, Playford, Ipswich.
 H. C.—2103. C.—2093.

Class 274.—Three Suffolk Ram Lambs.

- 2108 I. (**£10.**)—SIR ERNEST CASSELL'S EXORS., Carlton Grange, Newmarket.
 2111 II. (**£5.**)—G. A. GOODCHILD, The Oak House, Great Yeldham, Essex.
 2116 III. (**£3.**)—S. R. SHERWOOD, Playford, Ipswich.
 2106 IV. (**£2.**)—F. BONNER BARLING & SON, Amberley, Newmarket.
 2114 R. N.—WILLIAM F. PAUL, Kilton Lodge, Ipswich.
 2115 (H. C. & Special.)—J. P. ROSS-TAYLOR, Mungoswells, Duns.
 2119 (H. C. & R. N. for Special.)—G. BERTRAM SHIELDS, Dolphingstone, Tranent.
 C.—2109.

Class 275.—Three Suffolk Shearling Ewes.

- 2123 I. (**£10.**)—WILLIAM F. PAUL, Kilton Lodge, Ipswich.
 2120 II. (**£5.**)—R. L. BARCLAY, C.R.E., Higham, Gury St. Edmunds.
 2126 III. (**£3.**)—F. H. SANDERSON, Eshott Home Farm, Felton, Northumberland.
 2122 R. N.—A. PRESTON JONES, Mickleover House, Derby.
 C.—2121.

Class 276.—Three Suffolk Ewe Lambs.

- 2129 I. (**£10.**)—SIR ERNEST CASSELL'S EXORS., Carlton Grange, Newmarket.
 2141 II. (**£5.** & Special.)—G. BERTRAM SHIELDS, Dolphingstone, Tranent, East Lothian.
 2140 III. (**£3.**)—S. R. SHERWOOD, Playford, Ipswich.
 2132 IV. (**£2.**)—G. A. GOODCHILD, The Oak House, Great Yeldham, Essex.
 2139 R. N. & R. N. for Special.¹—F. H. SANDERSON, Eshott Home Farm, Felton, Northumberland.
 H. C.—2131, 2135. C.—2127, 2130.

Dorset Downs.

Class 277.—Dorset Down Shearling Rams.

- 2142 I. (**£10.**)—LIONEL DE ROTHSCHILD, M.P., Exbury, Southampton.
 2144 II. (**£5.**)—P. & C. SEWARD, Weston, Petersfield, Hants.
 H. C.—2145.

Class 278.—Three Dorset Down Shearling Ewes.

- 2146 I. (**£10.** & Champion.)²—LIONEL DE ROTHSCHILD, M.P., Exbury, Southampton.
 2148 II. (**£5.**)—P. & C. SEWARD, Weston, Petersfield, Hants.
 H. C.—2147. C.—2149.

Class 279.—Three Dorset Down Ram Lambs.³

- 2151 I. (**£10.** & R. N. for Champion.)⁴—HOOVER BROTHERS, Newburgh Farm, Winfrith, Dorset.
 2152 II. (**£5.**)—P. & C. SEWARD, Weston, Petersfield, Hants.

Ryelands.

Class 280.—Ryeland Rams, Two Shear and upwards.⁵

- 2161 I. (**£10.** & Champion.)⁶—DAVID J. THOMAS, Talachddu, Brecon, for Talachddu Eminent 1264, born in 1921.
 2150 II. (**£5.**)—J. Q. ROWETT, Ely Place, Frant, Sussex, for Ely Aeme 1221, born in 1920.
 2160 III. (**£3.**)—J. Q. ROWETT, for Ely Excelsior 1220, born in 1921.
 2156 R. N.—T. L. MARTIN, Ashe Warren House, Overton, Basingstoke, for Tidmarsh.
 H. C.—2157.

¹ Special Prize of £5 given by the Suffolk Sheep Society for the best Pen of Ram Lambs in Class 274, bred north of the Humber.

² Special Prize of £5 given by the Suffolk Sheep Society for the best Pen of Ewe Lambs in Class 278, bred north of the Humber.

³ Champion Prize of £10 given through the Dorset Down Sheep Breeders' Association for the best exhibit of Dorset Down Sheep in Classes 277-279.

⁴ Prizes given by the Dorset Down Sheep Breeders' Association.

⁵ Prizes given by the Ryeland Flock Book Society.

⁶ Silver Challenge Cup, given through the Ryeland Flock Book Society, for the best exhibit of Ryeland Sheep in Classes 280-284.

cvi *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 281.—*Ryeland Shearing Rams.*

- 2163 I. (£10. & R. N. for Champion.)—E. W. LANGFORD, LTD., Wye Stores, Hereford.
 2171 II. (£5.)—DAVID J. THOMAS, Talachddu, Brecon, for *Talachddu Factor*.
 2170 III. (£3.)—J. Q. ROWETT, Ely Place, Frant, Sussex, for *Ely Spartan*.
 2165 R. N.—T. L. MARTIN, Ashe Warren House, Overton, Basingstoke, for *Ashe Buster*.
 H. C.—2162, 2172. C.—2169, 2173.

Class 282.—*Three Ryeland Ram Lambs.*

- 2177 I. (£10.)—T. L. MARTIN, Ashe Warren House, Overton, Basingstoke.
 2176 II. (£5.)—E. W. LANGFORD, LTD., Wye Stores, Hereford.
 2179 III. (£3.)—J. R. NORMAN WATERS, Fawke Farm, Sevenoaks.
 2178 R. N.—J. Q. ROWETT, Ely Place, Frant, Sussex.

Class 283.—*Three Ryeland Shearing Ewes.*

- 2184 I. (£10.)—J. R. NORMAN WATERS, Fawke Farm, Sevenoaks.
 2180 II. (£5.)—E. W. LANGFORD, LTD., Wye Stores, Hereford.
 2181 III. (£3.)—T. L. MARTIN, Ashe Warren House, Overton, Basingstoke.
 2183 R. N.—J. Q. ROWETT, Ely Place, Frant, Sussex.
 H. C.—2182.

Class 284.—*Three Ryeland Ewe Lambs.*

- 2186 I. (£10.)—E. W. LANGFORD, LTD., Wye Stores, Hereford.
 2187 II. (£5.)—T. L. MARTIN, Ashe Warren House, Overton, Basingstoke.
 2189 III. (£3.)—J. R. NORMAN WATERS, Fawke Farm, Sevenoaks.
 2188 R. N.—J. Q. ROWETT, Ely Place, Frant, Sussex.

Kerry Hill (Wales).

Class 285.—*Kerry Hill (Wales) Rams, Two Shear and upwards.*¹

- 2190 I. (£10.)—DINAM ESTATES COMPANY, Llandinam, Co. Montgomery, for *Millingale Ultra 6468*, born in 1919, bred by C. S. Williams, Lower Mellington, Churchstoke, Mont.
 2191 II. (£5.)—ROBERT E. PARKER, Easton, Norwich, for *Pentrenant Oxo 6568*, born in 1919, bred by W. V. Davies, Pentrenant, Montgomery.
 2192 III. (£3.)—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for *Eaton Musician 7511*, born in 1921.

Class 286.—*Kerry Hill (Wales) Shearing Rams.*

- 2193 I. (£10.)—DINAM ESTATES COMPANY, Llandinam, Co. Montgomery, for *Gwernygae Challenger*, bred by David Davies, M.P., Llandinam.
 2195 II. (£5.)—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for *Eaton Nonsuch*.
 2194 III. (£3.)—DINAM ESTATES COMPANY, for *Gwernygae Challenger*, bred by David Davies, M.P., Llandinam.

Class 287.—*Kerry Hill (Wales) Ram Lambs.*

- 2197 I. (£10), 2196 III. (£3), and 2196 R. N.—ROBERT E. PARKER, Easton, Norwich.
 2199 II. (£5.)—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for *Eaton Opportunity*.

Class 288.—*Three Kerry Hill (Wales) Shearing Ewes.*

- 2200 I. (£10.)—DINAM ESTATES COMPANY, Llandinam, Co. Montgomery, for ewes bred by David Davies, M.P., Llandinam.
 2202 II. (£5.)—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester.
 2201 III. (£3.)—ROBERT E. PARKER, Easton, Norwich.

¹ Silver Challenge Cup, given through the Ryeland Flock Book Society, for the best exhibit of Ryeland Sheep in Classes 280–284.

² Prizes given by the Kerry Hill (Wales) Flock Book Society.

Lincolns.

Class 289.—*Lincoln Two Shear Rams.*¹

- 2204 I. (**#10. & Champion.**)²—CLIFFORD NICHOLSON, Horkstow Manor, Barton-on-Humber, for Horkstow Manor Marvel.
2208 II. (**#5.**) and 2207 III. (**#3.**)—W. H. RAWNSLEY and C. W. TINDALL, Well Vale, Alford, and Park House, Louth.
2205 R. N.—CLIFFORD NICHOLSON, for Horkstow Manor No. 70.
H. C.—2203.

Class 290.—*Lincoln Shearling Rams.*

- 2210 I. (**#10. & R. N. for Champion** ³), and 2209 R. N.—J. H. DEAN & SONS, Heath House, Nocton, Lincoln.
2215 II. (**#5.**)—CLIFFORD NICHOLSON, Horkstow Manor, Barton-on-Humber.
2217 III. (**#3.**)—W. H. RAWNSLEY and C. W. TINDALL, Well Vale, Alford, and Park House, Louth.
H. C.—2216. C.—2214.

Class 291.—*Five Lincoln Shearling Rams.*¹

- 2220 I. (**#15.**)—J. H. DEAN & SONS, Heath House, Nocton, Lincoln.
2227 II. (**#10.**)—J. M. STRICKLAND, Balnesse, Catterick, Yorks.
2221 III. (**#3.**)—ROBERT FISHER, Leonfield, Beverley, Yorks.
2226 IV. (**#2.**)—W. H. RAWNSLEY and C. W. TINDALL, Well Vale, Alford, and Park House, Louth.
2222 R. N.—CHARLES E. HOWARD, Nocton Rise, Lincoln.
H. C.—2224.

Class 292.—*Three Lincoln Ram Lambs.*

- 2228 I. (**#10.**)—J. H. DEAN & SONS, Heath House, Nocton, Lincoln.
2229 II. (**#5.**)—ROBERT FISHER, Leonfield, Beverley, Yorks.
2234 III. (**#3.**)—W. H. RAWNSLEY and C. W. TINDALL, Well Vale, Alford, and Park House, Louth.
2231 R. N.—CHARLES E. HOWARD, Nocton Rise, Lincoln.
H. C.—2232.

Class 293.—*Three Lincoln Shearling Ewes.*

- 2236 I. (**#10.**)—CHARLES E. HOWARD, Nocton Rise, Lincoln.
2238 II. (**#5.**)—W. H. RAWNSLEY and C. W. TINDALL, Well Vale, Alford, and Park House, Louth.
2237 III. (**#3.**)—CLIFFORD NICHOLSON, Horkstow Manor, Barton-on-Humber.
2235 R. N.—ROBERT FISHER, Leonfield, Beverley, Yorks.

Class 294.—*Three Lincoln Ewe Lambs.*

- 2240 I. (**#10.**)—J. H. DEAN & SONS, Heath House, Nocton, Lincoln.
2242 II. (**#5.**)—CHARLES E. HOWARD, Nocton Rise, Lincoln.
2244 III. (**#3.**)—W. H. RAWNSLEY and C. W. TINDALL, Well Vale, Alford, and Park House, Louth.
2241 R. N.—ROBERT FISHER, Leonfield, Beverley.
H. C.—2243.

Leicesters.

Class 295.—*Leicester Shearling Rams.*

- 2248 I. (**#10. & Champion.**)¹—GEORGE HARRISON, Gainford Hall, Darlington.
2250 II. (**#5. & R. N. for Champion.**)²—C. H. SIMPSON & SONS, Castle House, Hunmanby
2250 III. (**#3.**) and 2251 R. N.—WILLIAM JORDAN, Eastburn, Driffield.
H. C.—2255. C.—2254.

¹ Prizes given by the Lincoln Long-Wool Sheep Breeders' Association.

² Champion Prize of £5 given by the Lincoln Long-Wool Sheep Breeders' Association for the best Ram in Classes 289 and 290.

³ Champion Silver Medal given by the Leicester Sheep Breeders' Association for the best exhibit in Classes 295-298.

cx *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 296.—Leicester Ram Lambs.

- 2250 I. (£10), and 2260 III. (£3).—GEORGE HARRISON, Gainford Hall, Darlington.
 2263 II. (£5).—WILLIAM JORDAN, Eastburn, Driffeld.
 2257 R. N.—WILFRID APPELYARD, Filkton Manor, Scarborough.
 H. C.—2265. C.—2258.

Class 297.—Leicester Shearling Ewes.

- 2271 I. (£10), and 2272 III. (£3).—WILLIAM JORDAN, Eastburn, Driffeld.
 2279 II. (£5), and 2278 R. N.—C. H. SIMPSON & SONS, Castle House, Hunmanby, Yorks.
 H. C.—2277. C.—2270.

Class 298.—Leicester Ewe Lambs.¹

- 2292 I. (£10).—C. H. SIMPSON & SONS, Castle House, Hunmanby, Yorks.
 2267 II. (£5).—WILLIAM JORDAN, Eastburn, Driffeld.
 2290 III. (£3).—R. MEGGINSON, Garton Field, Driffeld.
 2283 R. N.—GEORGE HARRISON, Gainford Hall, Darlington.
 H. C.—2284.

Border Leicesters.

Class 299.—Border Leicester Rams, Two Shear and upwards.

- 2296 I. (£10).—ANDREW M. MONTGOMERY, Netherhall, Castle Douglas, for **Bold Threave** born in 1921, bred by T. & M. Templeton, Sandyknowe, Kelso.
 2295 II. (£5).—J. G. MACBETH, Dunira, Comrie, Perthshire, for **Bold Sadyknowe** 5612, born in 1920, bred by T. & M. Templeton, Sandyknowe, Kelso.
 2299 III. (£3).—WILLIAM ROBSON, Low Hedgeley, Powburn, Northumberland, for **Longshot** 5176, born in 1918, bred by James Jeffrey, Deuchrie, Prestonkirk.
 2293 R. N.—THE EARL OF BALFOUR, K.G., Whittinghame, Prestonkirk, for **Deuchrie Draught**.
 H. C.—2297, 2300. C.—2298.

Class 300.—Border Leicester Shearling Rams.

- 2310 I. (£10, & R. N. for Champion).—JOHN KINNAIRD, Newmains, Stenton, Prestonkirk.
 2316 II. (£5).—R. G. MURRAY & SON, Spittal, Biggar.
 2313 III. (£3).—ANDREW M. MONTGOMERY, Netherhall, Castle Douglas.
 2321 R. N.—WILLIAM R. ROSS, Culloden, Inverness.
 H. C.—2317, 2318. C.—2322.

Class 301.—Border Leicester Ewes, Two Shear and upwards, with their Lambs at foot.²

- 2326 I. (£10, & Champion).—THE EARL OF BALFOUR, K.G., Whittinghame, Prestonkirk, for ewe born in 1919.
 2330 II. (£5).—W. G. MACBETH, Dunira, Comrie, Perthshire, for ewe born in 1918, bred by P. Gordon Richmond, Balmyle, Perth.
 2331 III. (£3).—R. G. MURRAY & SON, Spittal, Biggar, for ewe born in 1919.
 2334 R. N.—WILLIAM R. ROSS, Culloden, Inverness.
 H. C.—2333. C.—2332.

Class 302.—Border Leicester Shearling Ewes.

- 2346 I. (£10).—R. G. MURRAY & SON, Spittal, Biggar.
 2347 II. (£5), and 2348 III. (£3).—ALEX NIVEN, Ayton, Newburgh, Fife.
 2349 R. N.—WILLIAM ROBSON, Low Hedgeley, Powburn, Northumberland.
 H. C.—2345, 2350. C.—2337, 2352.

Half-Breds.⁴

(*Border Leicester and Cheviot.*)

Class 303.—Shearling Rams, by a Border Leicester Ram from a Cheviot Ewe.

- 2354 I. (£10), and 2355 III. (£3).—THOMAS ARMSTRONG, East Cote, Hawick.
 2359 II. (£5), and 2357 R. N.—JOHN ELLIOT, Blackhaugh, Clovenfords.

¹ Prizes given by the Leicester Sheep Breeders' Association.

² Perpetual Challenge Cup, value Sixty Guineaes, given by the Society of Border Leicester Sheep Breeders for the best Ram or Ewe in Classes 299-302. A Gold Medal will be given by the Society of Border Leicester Sheep Breeders to the winner of the Challenge Cup.

³ Prizes given by the Society of Border Leicester Sheep Breeders.

⁴ Prizes given by the Newcastle Local Committee.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. cxi

Class 304.—*Ewes, Two Shear and upwards, by a Border Leicester Ram from a Cheviot Ewe, or by a half-bred Ram from a half-bred Ewe.*

- 2358 I. (410).—MRS. A. E. BURDON, Wooperton Farm, Northumberland, for ewe born in 1918.
2359 II. (45.)—MRS. A. E. BURDON, for ewe born in 1920.
2360 III. (43.)—ALEX. RITSON, Thoruton, Berwick-on-Tweed, for ewe born in 1920.

Class 305.—*Shearling Ewes, by a Border Leicester Ram from a Cheviot Ewe, or by a half-bred Ram from a half-bred Ewe.*

- 2361 I. (410), and 2362 II. (45.)—MRS. A. E. BURDON, Wooperton Farm, Northumberland.
2364 III. (43.)—ALEX. RITSON, Thoruton, Berwick-on-Tweed.

Wensleydales.

Class 306.—*Wensleydale Rams, Two Shear and upwards.*

- 2365 I. (410).—JOHN ALLISON, Howgrave Hall, Kirklington, Bedale, for *Howgrave King*, born in 1921, bred by Alice and Chester, Low Moor, Ripon.
2367 II. (45.)—JOHN W. GREENSIT, Holme-on-Swale, Thirsk, for *Royal Crossrigg* 2786, born in 1920, bred by Thomas Burton, Aldbro', Darlington.
2366 III. (43.)—RICHARD CHESTER, Low Moor Farm, Ripon, for *Lord Ripon*, born in 1921.
2369 R. N.—WILLIAM T. MILNER, Slyné Hall, Lancaster, for *Preceptor*.

Class 307.—*Wensleydale Shearling Rams.*

- 2375 I. (410).—R. H. MILNER, Borwick Lodge, Carnforth, for *Borwick Royal Guild*.
2377 II. (45.)—JOHN A. WILLIS, Manor House, Carperby, Yorks, for ram bred by John Hargrave, Wath, Ripon.
2372 III. (43.)—JOHN W. GREENSIT, Holme-on-Swale, Thirsk.
2378 R. N.—JOHN A. WILLIS.
H. C.—2371. C.—2380.

Class 308.—*Three Wensleydale Shearling Rams.*

- 2382 I. (410).—JOHN W. GREENSIT, Holme-on-Swale, Thirsk, for rams bred by M. Burton, Sutton-under-Whitestonecliffe.
2383 II. (45.)—JOHN HARGRAVE, Wath, Ripon.
2384 III. (43.)—JOHN A. WILLIS, Manor House, Carperby, Yorks.
2381 R. N.—RICHARD CHESTER, Low Moor Farm, Ripon.

Class 309.—*Three Wensleydale Shearling Ewes.*

- 2388 I. (410).—R. H. MILNER, Borwick Lodge, Carnforth, for ewes bred by Lord Henry Bentinck, Underley Hall, Kirkby Lonsdale.
2389 II. (45.)—JOHN A. WILLIS, Manor House, Carperby, Yorks.
2386 III. (43.)—JOHN W. GREENSIT, Holme-on-Swale, Thirsk.
2387 R. N.—JOHN HARGRAVE, Wath, Ripon.
H. C.—2385.

Class 310.—*Wensleydale Yearling Ewes, shown in Wool.*¹

- 2395 I. (410).—JOHN A. WILLIS, Manor House, Carperby, Yorks, for ewe bred by William Dinsdale, Low Bolton, Redmire.
2396 II. (45.)—JOHN A. WILLIS, Manor House, Carperby, Yorks.
2393 III. (43.)—T. E. CLARKE, Challan Hall, Silverdale, Lancs, for ewe bred by Lord Henry Bentinck, Underley Hall, Kirkby Lonsdale.
2390 R. N.—JOHN ALLISON, Howgrave Hall, Bedale, Yorks.
H. C.—2391.

¹ Prizes given by the Wensleydale Long-wool Sheep Breeders' Association.

Kent or Romney Marsh.

Class 311.—*Kent or Romney Marsh Two-Shear Rams.*

- 2401 I. (£10. & Champion ¹), 2402 II. (£5), and 2403 III. (£3).—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
2389 R. N.—L. H. & G. W. FINN, Westwood Court, Faversham, Kent.

Class 312.—*Kent or Romney Marsh Shearling Rams.*²

- 2418 I. (£15, & R. N. for Champion ¹).—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
2421 II. (£10), and 2420 R. N.—ASHLEY STEVENS, Davington Hall, Faversham.
2410 III. (£5).—L. H. and G. W. FINN, Westwood Court, Faversham.
2412 IV. (£3).—THE EARL OF GUILFORD, Waldershare Park, Dover.
H. C.—2422. C.—2414.

Class 313.—*Five Kent or Romney Marsh Shearling Rams.*²

- 2432 I. (£20).—ASHLEY STEVENS, Davington Hall, Faversham.
2431 II. (£15).—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
2428 III. (£10).—L. H. and G. W. FINN, Westwood Court, Faversham.
2434 IV. (£5).—WALTER F. WOOD, Chokes Court, Sittingbourne.
2429 R. N.—THE EARL OF GUILFORD, Waldershare Park, Dover.

Class 314.—*Three Kent or Romney Marsh Ram Lambs.*

- 2439 I. (£10), and 2440 R. N.—THE EARL OF GUILFORD, Waldershare Park, Dover.
2442 II. (£5), and 2443 III. (£3).—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
H. C.—2438.

Class 315.—*Three Kent or Romney Marsh Shearling Ewes.*

- 2447 I. (£10, & R. N. for Champion ²), and 2446 R. N.—THE EARL OF GUILFORD, Waldershare Park, Dover.
2445 II. (£5).—L. H. & G. W. FINN, Westwood Court, Faversham.
2450 III. (£3).—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
H. C.—2444.

Class 316.—*Three Kent or Romney Marsh Ewe Lambs.*

- 2458 I. (£10, & Champion ¹), and 2457 II. (£5).—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
2452 III. (£3).—J. RAYNER BETTES, Greenhill Farm, Otham, Maidstone.
2455 R. N.—THE EARL OF GUILFORD, Waldershare Park, Dover.
H. C.—2451.
Cup.⁴—J. E. QUESTED.
R. N. for Cup.⁴—THE EARL OF GUILFORD.

Cotswolds.

Class 317.—*Cotswold Shearling Rams.*⁵

- 2459 I. (£10), and 2460 III. (£3).—WILLIAM GARNE, Abington, Fairford, Glos.
2462 II. (£5), and 2461 R. N.—F. W. P. MATTHEWS, Manor Farm, Fildes, Oxford.

Class 318.—*Cotswold Ram Lambs.*

- 2463 I. (£10), and 2464 II. (£5).—WILLIAM GARNE, Abington, Fairford, Glos.
2465 R. N.—F. W. P. MATTHEWS, Manor Farm, Fildes, Oxford.

¹ Champion Prize of £10 10s. given by the Kent or Romney Marsh Sheep Breeders' Association for the best Ram in Classes 311 and 312.

² Prizes given by the Kent or Romney Marsh Sheep Breeders' Association.

³ Champion Prize of £10 10s. given by the Kent or Romney Marsh Sheep Breeders' Association for the best Pen of Ewes or Ewe Lambs in Classes 315 and 316.

⁴ Silver Challenge Cup, value Forty Guinea, given through the Kent or Romney Marsh Sheep Breeders' Association, for the best group of Sheep, bred by Exhibitor, consisting of Two Shear Ram, Shearling Ram, Pen of Three Ram Lambs, Pen of Three Shearling Ewes and Pen of Three Ewe Lambs, in Classes 311, 312, 314, 315 and 316.

⁵ Prizes given by the Cotswold Sheep Society.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. cxiii

Class 319.—*Cotswold Shearling Ewes.*

- 2467 I. (210), and 2468 R. N.—WILLIAM GARNE, Abington, Fairford, Glos.
2469 II. (25).—F. W. P. MATTHEWS, Manor Farm, Fifeild, Oxford.
C.—2470.

Class 320.—*Cotswold Ewe Lambs.*

- 2471 I. (210), and 2472 II. (25).—WILLIAM GARNE, Abington, Fairford, Glos.
2473 R. N.—F. W. P. MATTHEWS, Manor Farm, Fifeild, Oxford.

Exmoor Horns.

Class 321.—*Exmoor Horn Rams, Two Shear and upwards.¹*

- 2474 I. (210).—JOHN HARRIS, Wistland Pound, Kentisbury, Barnstaple, for ram born in 1921, bred by W. Gammie, Simonsbath, South Molton.
2475 II. (25).—JOHN HARRIS, for Wistland Pound No. 7, born in 1921.

Class 322.—*Exmoor Horn Shearling Rams.*

- 2477 I. (210).—JOHN HARRIS, Wistland Pound, Kentisbury, Barnstaple, for Wistland Pound No. 12.
2476 II. (25).—JOHN HARRIS, for Wistland Pound No. 11.

Class 323.—*Three Exmoor Horn Shearling Ewes.*

- 2478 I. (210), and 2479 II. (25).—JOHN HARRIS, Wistland Pound, Kentisbury, Barnstaple.

Herdwicks.

Class 324.—*Herdwick Rams, Two Shear and upwards.²*

- 2480 I. (210).—WILLIAM BIRKETT, Gillerthwaite, Emmerdale, Cleator, for Gillerthwaite 694, born in 1915.
2483 II. (25).—SIR JOHN F. RAMSDEN, BT., Muncaster Castle, Ravenglass, for Wastwater 097, born in 1916, bred by John Rothery, Walsdale Hall, Gosforth, Cumberland.
2482 III. (23).—SIR JOHN F. RAMSDEN, BT., for Blakelall 1539, bred by W. Abbot, Mockerkinn, Cockermouth.
2481 R. N.—LORD LECONFIELD, Cockermouth Castle, Cumberland, for Derby Royal.

Class 325.—*Herdwick Shearling Rams.*

- 2486 I. (210).—LORD LECONFIELD, Cockermouth Castle, Cumberland.
2489 II. (25).—RICHARD M. WILSON, Middle Row, Walsdale Head, Gosforth, Cumberland.
2488 III. (23).—SIR JOHN F. RAMSDEN, BT., Muncaster Castle, Ravenglass.
2485 R. N.—WILLIAM BIRKETT, Gillerthwaite, Emmerdale, Cleator, for Gillerthwaite Royal.

Class 326.—*Three Herdwick Shearling Ewes.*

- 2491 I. (210).—SIR JOHN F. RAMSDEN, BT., Muncaster Castle, Ravenglass.
2490 II. (25).—LORD LECONFIELD, Cockermouth Castle, Cumberland.

Swaledale Dales-Breds.³

Class 327.—*Swaledale Dales-Bred Rams, born in or before 1920.*

- 2495 I. (210).—JOHN L. PEACOCK, Punchard House, Arkingthorpe, Richmond, Yorks, for Jock-Jack 161, born in 1918, bred by W. Coates, Cottendale, Hawes.
2493 II. (25).—JONATHAN T. DARGUE, Forest Hall, Kendal, for ram born in 1919, bred by Raper Whitehead, Ravenscote, Swaledale.
2492 III. (23).—ROBERT L. CLOSE, Hazelgill, Bowes, Darlington, for Sledale Hero, born in 1919, bred by James Cleasby, Heggeseale, Winton, Kirby Stephen.
2494 R. N.—JAMES PEACOCK, Spanham House, Barningham, Darlington, for Spanham Fashion.

¹ Prizes given by the Exmoor Horn Sheep Breeders' Society.

² Prizes given by the Herdwick Sheep Breeders' Association.

³ 248 towards these Prizes were given by the Swaledale Dales-Bred Sheep Breeders' Association.

cxiv *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 328.—Swaledale Dales-Bred Rams, born in 1921.

- 2498 I. (£10).—JONATHAN T. DARGUE, Forest Hill, Kendal, for *Show Boy*, bred by GEORGE CHATKINSON, Fry House, Swaledale.
 2499 II. (£5).—JOSEPH W. DENT, Fair View, Middleton-in-Teesdale, for *Wooley Star*, bred by Matthew W. Peacock, Blake House, Lunedale, Middleton-in-Teesdale.
 2496 III. (£3).—THOMAS ADDISON, Strand Foot, Bowes, Darlington, for *Deepdale Gem*, bred by Christopher Hutchinson, Sleightholme, Bowes.
 2500 R. N.—JOHN L. PEACOCK, Punchard House, Arkingarthdale, for *Punchard Hero*.

Class 329.—Swaledale Dales-Bred Ram Hogs, born in 1922.

- 2508 I. (£10).—JAMES PEACOCK, Spanham House, Barningham, Darlington.
 2510 II. (£5).—T. M. THORNBORROW, West Millwaters, Bowes, Darlington, for *Moss Crop*, bred by Christopher Hutchinson, Sleightholme, Bowes, Darlington.
 2503 III. (£3).—ROBERT L. CLOSE, Hazelgill, Bowes, Darlington.
 2504 R. N.—JONATHAN T. DARGUE, Forest Hall, Kendal.

Class 330.—Three Swaledale Dales-Bred Ewes, born in or before 1921.

- 2514 I. (£10).—C. HUTCHINSON, Sleightholme, Bowes, Darlington, for ewes born in 1915 and 1919.
 2511 II. (£5).—JONATHAN T. DARGUE, Forest Hall, Kendal, for ewes born in 1920.
 2516 III. (£3).—JOHN LAWRENCE PEACOCK, Punchard House, Arkingarthdale, Richmond, Yorks, for ewes born in 1919 and 1920.
 2515 R. N.—JAMES PEACOCK, Spanham House, Barningham, Darlington.

Class 331.—Three Swaledale Dales-Bred Gimmer Hogs, born in 1922.

- 2518 I. (£10).—ROBERT L. CLOSE, Hazelgill, Bowes, Darlington.
 2517 II. (£5).—JOHN ARKING, New House, Ravenstonedale, Westmorland.
 2521 III. (£3).—JOHN L. PEACOCK, Punchard House, Arkingarthdale, Richmond, Yorks.
 2520 R. N.—JAMES PEACOCK, Spanham House, Barningham, Darlington.

Cheviots.¹

Class 332.—Cheviot Rams, Two Shear and upwards.

- 2522 I. (£10).—J. T. & J. J. DODD, Riccarton, Newcastle-on-Tyne, N.B., for *Newlands No. 1*, born in 1921, bred by MESSRS. HOGG, Newlands, Gifford.
 2530 II. (£5).—MESSRS. THOMSON, Bushelhill, Cockburnspath, N.B., for *Able Geordie*, born in 1920, bred by John Robson, Milknoe, Duns.
 2525 III. (£3).—GEORGE ELLIOT, Brocklaid, Chathill, Northumberland, for ram born in 1921, bred by William Hogg, Newlands, Gifford.
 2527 R. N.—GEORGE HOGG, Pennmanshield, Grantshouse.
 H. C.—2523, 2526.

Class 333.—Cheviot Shearling Rams.

- 2543 I. (£10).—MESSRS. THOMSON, Bushelhill, Cockburnspath, N.B., for *Adonis*.
 2536 II. (£5).—JOHN ELLIOT, Blackhaugh, Clovenfords.
 2538 III. (£3).—GEORGE HOGG, Pennmanshield, Grantshouse, Derwicksire.
 2540 R. N.—JOHN ROBSON, Milknoe, Duns.

Class 334.—Cheviot Ewes, Two Shear and upwards, with their Lambs at foot.

- 2546 I. (£10, & R. N. for Champion).—GEORGE LINTON and JOHN ROBSON, JUN., Path Head, Dunbar, and Lynegar, Watten, Caithness, for ewe born in 1919.
 2548 II. (£5).—MESSRS. THOMSON, Bushelhill, Cockburnspath, N.B., for ewe born in 1920.
 2544 III. (£3).—WALTER S. DOUGLAS, Hindhope, Jedburgh, for ewe born in 1921.
 2547 R. N.—JOHN ROBSON, Milknoe, Duns.

Class 335.—Cheviot Shearling Ewes.

- 2553 I. (£10, & Champion), and 2554 III. (£3).—JOHN ELLIOT, Blackhaugh, Clovenfords.
 2549 II. (£5).—J. T. & J. J. DODD, Riccarton, Newcastle-on-Tyne, N.B.
 2561 R. N.—MESSRS. THOMSON, Bushelhill, Cockburnspath, N.B., for *Lady Georgina*.

¹ £30 towards these Prizes were given through the Cheviot Sheep Society.

² The "Borthwick" Challenge Cup given by the Cheviot Sheep Society for the best Cheviot Ram or Ewe in Classes 332-335.

Welsh Mountain.

Class 336.—*Welsh Mountain Rams, Shearling and upwards.*

- 2565 I. (**£10.**)—THE UNIVERSITY COLLEGE OF NORTH WALES, College Farm, Aber, Bangor, for **Snowdon N. 18** 1183, born in 1921.
2562 II. (**£5.**)—MAJOR ERIC J. W. PLATT, Gorddinoeg, Llanfairfechan, North Wales, for **Madryn N. 3** 1052, born in 1921.
2564 R. N.—THE UNIVERSITY COLLEGE OF NORTH WALES, for **Snowdon N. 10.**

Class 337.—*Three Welsh Mountain Shearling Ewes.*

- 2568 I. (**£10.**)—THE UNIVERSITY COLLEGE OF NORTH WALES, College Farm, Aber, Bangor.
2567 II. (**£5.**), and 2566 R. N.—MAJOR ERIC J. W. PLATT, Gorddinoeg, Llanfairfechan, N Wales.

Black Welsh Mountain.

Class 338.—*Black Welsh Mountain Shearling Rams.*

- 2572 I. (**£10.**)—MRS. JERVOISE, Herriard Park, Basingstoke, for ram bred by Lord Harlech, Brogyfaen, Oswestry.
2570 II. (**£5.**)—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for **Burton Court No. 4**, bred by Col. P. J. Clowes, Burton Court, Leominster.
2571 R. N.—ALFRED E. W. DARBY, Adcote, Shrewsbury.

Class 339.—*Three Black Welsh Mountain Shearling Ewes.*¹

- 2575 I. (**£10.**), and 2576 R. N.—MRS. JERVOISE, Herriard Park, Basingstoke.
2574 II. (**£5.**)—ALFRED E. W. DARBY, Adcote, Shrewsbury.

Black-Faced Mountain.²

Class 340.—*Black-faced Mountain Rams, Two Shear and upwards.*

- 2583 I. (**£10. & Champion.**)—O. MONKHOUSE, Cowhill, Wearhead, Co. Durham, for **Sunshine** 125, born in 1920.
2582 II. (**£5.**)—O. MONKHOUSE, for **Sunbeam** 208, born in 1921.
2577 III. (**£3.**)—MAJOR ALEXANDER BROWSE, Callaly Castle, Whittingham, Northumberland, for **Onward** 334, born in 1921, bred by Matthew Hamilton, Woolfords, Cobbinshaw.
2585 R. N.—JOHN ROBSON, Newton, Bellingham, for **Conservative**.
H. C.—2586.

Class 341.—*Black-faced Mountain Shearling Rams.*

- 2587 I. (**£10. & R. N. for Champion.**)—MAJOR ALEXANDER BROWSE, Callaly Castle, Whittingham, Northumberland.
2588 II. (**£5.**)—JOHN C. MURRAY, Tarsel Hall, Bellingham, Northumberland.
2587 III. (**£3.**)—O. MONKHOUSE, Cowhill, Wearhead, Co. Durham, for **Paymaster**.
2596 R. N.—O. MONKHOUSE, for **His Majesty**.
H. C.—2600.

Class 342.—*Black-faced Mountain Ewes, Two Shear and upwards, with their Lambs at foot.*

- 2610 I. (**£10.**)—JOHN ROBSON, Newton, Bellingham, Northumberland, for **Lady Edinburgh**, born in 1919.
2603 II. (**£5.**)—MAJOR ALEXANDER BROWSE, Callaly Castle, Whittingham, Northumberland, for ewe born in 1921.
2608 III. (**£3.**)—O. MONKHOUSE, Cowhill, Wearhead, Co. Durham, for ewe born in 1920.
2606 R. N.—ARTHUR CAYLEY, Earham, Cornhill-on-Tweed.

¹ Prizes given by the Black Welsh Mountain Sheep Breeders' Association.

² £20 towards these Prizes were given by the English Black-face Sheep Society, and £10 by Breeders in Scotland.

³ Champion Cup, value £10, given by the English Black-face Sheep Society for the best Black-faced Mountain Ram or Ewe in Classes 340-343 from a registered Flock in the English Black-face Flock Book.

cxvi *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 343.—Black-faced Mountain Shearling Ewes.

- 2617 I. (410).—O. MONKHOUSE, Cowshill, Wearhead, Co. Durham, for *Queen of the Ring*.
 2618 II. (43).—O. MONKHOUSE, for *Bents Pride*.
 2621 III. (43), and 2622 R. N.—JOHN ROSSON, Newton, Bellingham, Northumberland.
 H. C.—2612.

PIGS.

Large Whites.

Class 344.—Large White Boars, born in or before 1921.

- 2635 I. (410, Champion,¹ & Champion.²)—EDMUND WHERRY, Bourne, Lincolnshire, for *Bourne King David* 36437 (T.N. 4402), born July 1, 1921; s. Bourne King John 2601, d. Bourne Queen 26th 65034 by Bourne Bar None 23847.
 2628 II. (43).—SIR GILBERT GARNALL, Bt., C.V.O., Walton Hall, Warrington, for Boxed *Turk* 33117 (T.N. 187), born Jan. 30, 1921, bred by Essex County Council, Boxed Ex-Service Colony, Colchester; s. Turk of Bottesford 27417, d. Jewel of Boxed 60062 by Bonnie Bourne 22029.
 2631 III. (43).—ROWLAND P. HAYNES, Delves Green Farm, Wednesbury, Staffs, for *Banner of Caldmore* 25879 (T.N. 9090), born Jan. 7, 1919, bred by A. W. White, Hillegom, Spalding; s. Banner of Spalding 21987, d. Perfection of Spalding 59206 by Jay of Wythston 16149.
 2623 R. N.—R. W. CARSON, Halsc, Brackley, for *Turk of Bottesford*.
 H. C.—2625, 2630, 2636. C.—2626, 2629.

Class 345.—Large White Boars, born in 1922, before July 1.³

- 2646 I. (410, & R. N. for Champion.⁴)—EDMUND WHERRY, Bourne, for *Bourne Bar None* 2541th 36329 (T.N. 4643), born Jan. 3; s. Bourne Bar None 125th 28835, d. Bourne Bonetta 64892 by Bourne Bandmaster 50th 23071.
 2639 II. (43).—THE DOWAGER LADY BETTON, Rugeley Farm, Burton-on-Trent, for *Bourne Bar None* 233rd 36337 (T.N. 4642), born Jan. 3, bred by Edmund Wherry, Bourne, Lincs; s. Bourne Bar None 125th 28835, d. Bourne Bonetta 64392 by Bourne Bandmaster 50th 22071.
 2641 III. (43).—THE EARL OF BLESINGHE, Stetchworth Park, Newmarket, for *Stetchworth Turk* 21st 37699 (T.N. 1353), born Jan. 4; s. Turk of Stetchworth 2nd 30729, d. Stetchworth Empress 39th 81184 by Tockwith Bandmaster 24691.
 2642 R. N.—FRANK W. HICKTON, Belbroughton, Stourbridge, for *Turk of Brookfield*.
 H. C.—2644.

Class 346.—Large White Boars, born in 1922, on or after July 1.³

- 2664 I. (410).—ALFRED W. WHITE, Hillegom, Spalding, for *Spalding Jay* 3rd (T.N. 2137), born July 6; s. Jay of Spalding 33711, d. Spalding Catalina 5th 55130 by Spalding Wonder 3rd 20227.
 2647 II. (43).—BIRCH & BULMER, High Street, Spalding, for *Welland Jay* 1st (T.N. 301), born July 2; s. Bob of Bourne 28701, d. Podge Hole Perfection 80292 by Hercules of Walton 14th 26651.
 2656 III. (43).—ROWLAND P. HAYNES, Delves Green Farm, Wednesbury, for *Macbeth of Caldmore* (T.N. 71), born Sept. 2, bred by F. Ball, Brampton Hill, Northampton; s. Brampton Macbeth 36463, d. Brampton Lassie 6th 77162 by Victor of Brampton 26761.
 2665 R. N.—ALFRED W. WHITE, for *Spalding Jay* 4th.
 H. C.—2645, 2661. C.—2668, 2662.

Class 347.—Large White Boars, born in 1923.

- 2696 I. (410).—EDMUND WHERRY, Bourne, for *Bourne Champion Boy* 38th (T.N. 5023), born Jan. 2; s. Bourne Champion Boy 33091, d. Bourne Bonetta 7th 76952 by Baron of Bourne 23633.
 2698 II. (43).—ALFRED W. WHITE, Hillegom, Spalding, for *Spalding Monitor* 7th (T.N. 3097), born Jan. 4; s. Spalding Monitor 4th 37643, d. Histon Belle 38th 90762 by Histon Eastern Turk 22683.
 2676 III. (43).—DANIEL R. DAYBELL, Bottesford, Nottingham, for *boar* (T.N. 550), born Jan. 29; s. Monitor of Bottesford 33851, d. Bottesford Buttercup 41st 64830 by Worsley Jay 87th 27619.
 2675 R. N.—DANIEL R. DAYBELL.
 H. C.—2679, 2686. C.—2673, 2674.

¹ Champion Gold Medal given by the National Pig Breeders' Association for the best Large White Boar in Classes 344-347.

² Silver Challenge Cup, value Thirty Guineas, given by the National Pig Breeders' Association for the best Large White Pig in Classes 344-350.

³ Prizes given by the National Pig Breeders' Association.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. cxvii

Class 348.—Large White Breeding Sows, born in or before 1921.

- 2720 I. (#10, R. N. for Champion,¹ & Champion,²)—W. WHITE & SONS, Pool Farm, Taunton, for Taunton Amy 81422 (T.N. 133), born July 2, 1920, farrowed Feb. 20; s. Histon Snowman 24047, d. Histon Amy 6th 69812 by Histon Lion Heart 22451.
 2718 II. (#5.)—EDMUND WHERRY, Bourne, for Worsley Bourne Queen 71103 (T.N. 9945), born Jan. 22, 1919, farrowed Feb. 9, bred by Sir Gilbert Greenall, Bt., C.V.O., Walton Hall, Warrington; s. Jay of Worsley 14th 16147, d. Worsley Queen 64th 48093 by Worsley Emperor 68th 19241.
 2712 III. (#3.)—HOWLAND P. HAYNES, Delves Green Farm, Wodnesbury, for Perfection of Shatterford 80234 (T.N. 2446), born Jan. 24, 1920, farrowed Jan. 14; s. Kingmaker 24151, d. Perfection of Caldmore 00800 by Banner of Spalding 21987.
 2711 R. N.—W. HALLAS, Bank House Farm, Helsby, Warrington, for Victorine of Helsby. H. C.—2705, 2716. C.—2708, 2714.

Class 349.—Large White Sows, born in 1922, before July 1.

- 2738 I. (#10, & R. N. for Champion,³)—EDMUND WHERRY, Bourne, for Bourne Bonetta 13th 88832 (T.N. 4645), born Jan. 3; s. Bourne Bar None 125th 28835, d. Bourne Bonetta 64892 by Bourne Bandmaster 50th 22071.
 2740 II. (#5.)—ALFRED W. WHITE, Hillegom, Spalding, for Spalding Catalina 29th 92670 (T.N. 2016), born Jan. 4; s. Spalding Kingmaker 30449, d. Spalding Catalina 6th 55130 by Spalding Wonder 3rd 20227.
 2739 III. (#3.)—EDMUND WHERRY, for Bourne Bonetta 14th 88834 (T.N. 4646), born Jan. 3; s. Bourne Bar None 125th 28835, d. Bourne Bonetta 64892 by Bourne Bandmaster 50th 22071.
 2736 R. N.—THE EARL OF ELLESMERE, Stetchworth Park, Newmarket, for Stetchworth Empress 45th. H. C.—2730, 2733. C.—2722, 2723.

Class 350.—Large White Sows, born in 1922, on or after July 1.³

- 2766 I. (#10.)—ALFRED W. WHITE, Hillegom, Spalding, for Spalding Lady Mollington 12th (T.N. 2135), born July 5; s. Spalding Banner 5th 30447, d. Histon Lady Mollington 6th 67406 by Spalding Turk 7th 21316.
 2758 II. (#5.)—S. E. EDDY'S PRO FARMS, LTD., Gallups Estate Office, Ditchling, Sussex, for Shipley Pride 21st (T.N. 211), born July 2, bred by L. Harrison & Co., Ltd., Coolham, Sussex; s. Nonsuch of Tockwith 2nd, 27069, d. Bushes Pride 5th 65564 by Bottesford Emperor 10th 19743.
 2757 III. (#3.)—SIR GILBERT GREENALL, Bt., C.V.O., Walton Hall, Warrington, for Mary of Walton (T.N. 309), born July 11, bred by Capt. R. S. Hall, New Hall, Tendring, Clacton-on-Sea; s. Worsley Jay 109th 54478, d. Mary of Tendring 60058 by Stetchworth Jay 3rd 32749.
 2747 R. N.—R. W. CARSON, Halse, Brackley, for Forest Bashful Lady. H. C.—2754, 2765. C.—2760, 2762.

Class 351.—Three Large White Sows, born in 1923.

- 2777 I. (#10.)—EDMUND WHERRY, Bourne, for sows, born Jan. 1; s. Bourne Champion Boy 33091, d. Bourne Bonetta 6th 76950 by Baron of Bourne 24633.
 2770 II. (#5.)—DANIEL R. DAYBELL, Bottesford, Nottingham, for sows, born Jan. 18; s. Lion Hollingsworth of Walnut 32781, d. Caldmore Bulwarp by Worsley Jay 91st 27827.
 2779 III. (#3.)—W. WHITE & SONS, Pool Farm, Taunton, for Taunton Amy 39th, 40th and 41st, born Jan. 6; s. Caldmore Jay, d. Taunton Amy 12th by Taunton Araby 3rd 27325.
 2771 R. N.—DANIEL R. DAYBELL. H. C.—2769. C.—2774.

Middle Whites.

Class 352.—Middle White Boars, born in or before 1921.

- 2761 I. (#10, Champion,⁴ & R. N. for Champion,⁵)—LEOPOLD C. PAGET, Middletorp Hall, York, for Wharfedale Deliverance 32575 (T.N. 957), born Jan. 3, 1920; s. Wharfedale Lichfoot 28351, d. Wharfedale Surety 57482 by Croxteth Banker 4th 20503.
 2784 II. (#5, & R. N. for Champion,⁶)—CIVENS & SONS, LTD., Histon, Cambridge, for Wratling Woodman 35957 (T.N. 9), born June 18, 1921, bred by F. Sainsbury, Bluns Hall, Little Wratling, Haverhill, Suffolk; s. Histon Woodman 28099, d. Histon Choice 19th 84576 by Shrewsbury 19511.

¹ Silver Challenge Cup, value Thirty Guinea, given by the National Pig Breeders' Association for the best Large White Pig in Classes 344-350.

² Champion Gold Medal given by the National Pig Breeders' Association for the best Large White Sow in Classes 345-350.

³ Prizes given by the National Pig Breeders' Association.

⁴ Champion Gold Medal given by the National Pig Breeders' Association for the best Middle White Boar in Classes 352-355.

⁵ Silver Challenge Cup, value Thirty Guinea, given by the National Pig Breeders' Association for the best Middle White Pig in Classes 352-355.

cxviii *Awards of Live Stock Prices at Newcastle-on-Tyne, 1923.*

2785 **III. (£3).**—S. F. EDGE'S PIG FARMS, LTD., Gallops Estate Office, Ditchling, Sussex, for **Shipley Sam** 32381 (T.N.L.H. 65), born Jan. 8, 1920, bred by L. Harrison & Co., Ltd., Cootham, Sussex; s. Pendley King 32179, d. Histon Royal Lady 63104 by Bookham of Harthay 19360.

2790 **R. N.**—ALBERT LAIRD, The Manor, Sundon, Dunstable, for **Sundon Rambler**.
H. C.—2781.

Class 353.—*Middle White Boars, born in 1922, before July 1.*

2799 **I. (£10).**—MRS. HAYES SADLER, Norsbury, Sutton Scotney, for **Hammonds Hero** (T.N. 301), born Jan. 17, bred by H. R. Beeton, Hammonds, Checkenden, Reading; s. Hammonds Perfection Pride 31675, d. Hammonds Hagar 4th 62972 by White Heather 29663.

2800 **II. (£5).**—CHARLES SPENCER, Milpond, Little Oakley, Harwich, for **Hollywell Rascald** (T.N. 494), born March 16; s. Histon Milpond 35161, d. Hollywell Milpond Mischief 2nd 73564 by Hillman of Harthay 25329.

2796 **III. (£3).**—THOMAS F. GALFREY, Demesne Farm, Shipton, Bealingsbrough, York, for **Southmore Brigadier** (T.N. 106), born Jan. 2, bred by W. R. Partridge, The Manor, Wombancote, Cirencester, Glos.; s. Fordmanor Robert 31553, d. Bookham Rose 20th 7365, by Peene Rifleman 28211.

2797 **R. N.**—COLONEL J. GRETTON, M.P., Stapleford Park, Milton Mowbray, for **Stortford Marquis**.
H. C.—2798.

Class 354.—*Middle White Boars, born in 1922, on or after July 1.*

2814 **I. (£10).**—LEOPOLD C. PAGET, Middlethorpe Hall, York, for **Apolló of Wharfedale** (T.N. 225), born July 15, bred by South Yorkshire Asylum Committee, Middlethorpe, Sheffield; s. Wharfedale Prince 32625, d. Wharfedale Pattle 6th by Lothian of Wharfedale 28133.

2808 **II. (£5).**—CHIVERS & SONS, LTD., Histon, Cambridge, for **Histon Shrewsbury 17th** (T.N. 362), born Aug. 2, bred by John Chivers, Wychfield, Cambridge; s. Histon Shrewsbury 15th 35185, d. Histon Joan 9th by Histon Woodman 28099.

2811 **III. (£3).**—J. H. HOLLAND, Peene House, Newington, Folkestone, for **Peene Slasher** (T.N. 490), born July 2; s. Peene Showman, d. Peene Milgon 8th by Boaz of Peene 2409.

2818 **R. N.**—MRS. HAYES SADLER, Norsbury, Sutton Scotney, for **Prestwood Peter Pan 2nd**.
H. C.—2805, 2810. C.—2802.

Class 355.—*Middle White Boars, born in 1923.*

2855 **I. (£10).**—MRS. HAYES SADLER, Norsbury, Sutton Scotney, for **boar** (T.N. 491), born Jan. 12; s. Scotty of Norsbury, d. Norsbury Virtue 63292 by Durbar of Histon 21679.

2852 **II. (£5).**—OLIVER W. PORTER, Hotchley Farm, East Leake, Loughborough, for **Hotchley Hermes 2nd** (T.N. 155), born Jan. 19; s. Burningsfold Hermes 34773, d. Hotchley Queenie 2nd by Aubrey Whitebell 27801.

2854 **III. (£3).**—THE EARL OF ROSEBURY, K.G., K.T., Dalmeny House, Edinburgh, for **Midlothian Perfect** (T.N. A. 733), born Jan. 3; s. Histon Rover 11th, d. Peene of Midlothian by Mick of Peene 32063.

2856 **R. N.**—MRS. HAYES SADLER.
H. C.—2857, 2857.

Class 356.—*Middle White Breeding Sows, born in or before 1921.*

2881 **I. (£10, Champion & Champion).**—LEOPOLD C. PAGET, Middlethorpe Hall, York, for **Wharfedale Royal Lady** 75956 (T.N. 380), born Jan. 7, 1920, farrowed March 21; s. Preserver of Wharfedale 25493, d. Wharfedale Opal 57442 by Pendley Lad 23191.

2868 **II. (£5).**—CHIVERS & SONS, LTD., Histon, Cambridge, for **Histon Welcome 19th** 34748 (T.N. 949), born Sept. 25, 1920, farrowed March 7, bred by John Chivers, Wychfield, Cambridge; s. Shrewsbury 19511, d. Welcome Histon 51000 by Sundon Scott 20368.

2877 **III. (£3).**—J. H. HOLLAND, Peene House, Newington, Folkestone, for **Peene Beauty 2nd** 63368 (T.N. 117), born Aug. 15, 1918, farrowed Feb. 23; s. Boaz of Peene 25169, d. Peene Polly 57084 by Peene Prince 1st 21761.

2869 **R. N.**—S. F. EDGE'S PIG FARMS, LTD., Gallops Estate Office, Ditchling, Sussex, for **Albany Sunflower Queen**.
H. C.—2874, 2875, 2890. C.—2866, 2867.

Class 357.—*Middle White Sows, born in 1922, before July 1.*

2902 **I. (£10, & R. N. for Champion).**—MRS. HAYES SADLER, Norsbury, Sutton Scotney, for **Hawthorn Holly 7th** (T.N. 80), born Feb. 18, bred by Mrs. Susman, Henley-on-Thames; s. Bold Boy of Hawthorn 34709, d. Histon Hollybush 9th 84616 by Histon Shrewsbury 2nd 28081.

2899 **II. (£5).**—LEOPOLD C. PAGET, Middlethorpe Hall, York, for **Arrington Alice 3rd** (T.N. 89), born Jan. 4, bred by the Hon. G. Agar-Robartes, Wimpey Hall, Royston, Cambs.; s. Wizard of Arrington 82629, d. Histon Bridesmaid 63029 by Histon Halo 28339.

¹ Prizes given by the National Pig Breeders' Association.
² Silver Challenge Cup, value Thirty Guinea, given by the National Pig Breeders' Association for the best Middle White Pig in Classes 352-358.
³ Champion Gold Medal given by the National Pig Breeders' Association for the best Middle White Sow in Classes 356-358.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. *cxix*

- 2838 **III. (23).—ALBERT LAIRD**, The Manor, Sundon, Dunstable, Beds., for *Sundon Melody* (T.N. 2391), born Jan. 1; *s. Holywell Charlie, d. Peene Bountiful 74449 by Peene Shrewsbury 28218.*
 2884 **R. N.—CHIVERS & SONS, LTD.**, Histon, Cambridge, for *Histon Welcome 31st.*
H. C.—2685, 2903. C.—2591, 2901, 2907.

Class 358.—Middle White Sows, born in 1922, on or after July 1.

- 2936 **I. (10).—LEOPOLD C. PAGET**, Middlethorpe Hall, York, for *Wharfedale Calico* (T.N. 297), born July 7; *s. Wharfedale Sportsman 35921, d. Prestwood Mary 9th 74718 by Prestwood Acrobat 1st 23197.*
 2938 **II. (25).—MRS. HAYES SADLER**, Norsbury, Sutton Scotney, for *Norsbury Welcome* (T.N. 366), born July 14; *s. Norsbury Vaughan, d. Histon Welcome 9th 73456 by Histon Halo 25339.*
 2914 **III. (23).—COMMANDER AND MRS. BOULSOIS**, The Navy Pig Farm, Yateley, Hants, for *Yately Marguerite* (T.N. 61), born Aug. 16; *s. Norsbury Valour 32039, d. Beenharn Mongolia 4th 71834 by Hope of Hammonds 25361.*
 2918 **R. N.—CHIVERS & SONS, LTD.**, Histon, Cambridge, for *Histon Choice 48th.*
H. C.—2928, 2946. C.—2920.

Class 359.—Three Middle White Sows, born in 1923.

- 2965 **I. (10).—THE EARL OF ROSEBURY**, K.G., K.T., Dalmeny House, Edinburgh, for sows, born Jan. 4; *s. Histon Rover 11th, d. Jingo of Midlothian 73686 by Caldmore of Midlothian 25183.*
 2962 **II. (25).—ALBERT LAIRD**, The Manor, Sundon, Dunstable, for sows, born Jan. 3; *s. Sundon Music Hall, d. Sundon Fly 87446 by Sundon Ramdler 32469.*
 2961 **III. (23).—COMMANDER AND MRS. BOULSOIS**, The Navy Pig Farm, Yateley, Hants, for sows, born Feb. 19; *s. Norsbury Valour 32099, d. Beenharn Mongolia 4th 71834 by Hope of Hammonds 25361.*
 2967 **R. N.—LT.-COL. H. SPENDER-CLAY, M.P.**, Ford Manor, Lingfield, Surrey.
H. C.—2960, 2958. C.—2959.

Tamworths.

Class 360.—Tamworth Boars, born in or before 1921.

- 2971 **I. (10, Champion,* & Champion¹).—ROBERT IBBOTSON**, Knowle, Dorridge, Birmingham, for *Knowle Bruce 36013* (T.N. 348), born Aug. 3, 1921; *s. Knowle Darlington 32469, d. Basildon Lady Manners 2nd 63836 by Basildon Able 25675.*
 2972 **II. (25).—MAJOR J. A. MORRISON**, D.S.O., Basildon Park, Goring, Reading, Berks, for *Knowle Darlington 32687* (T.N. 136), born Jan. 6, 1920, bred by Robert Ibbotson, Knowle, Dorridge; *s. Basildon Max 25683, d. Knowle Model 10th 52048 by Knowle Arundel 21855.*

Class 361.—Tamworth Boars, born in 1922.¹

- 2973 **I. (10).—ROBERT IBBOTSON**, Knowle, Dorridge, Birmingham, for *Knowle Newcastle* (T.N. 486), born Aug. 23; *s. Knowle Prince Alfred 30031, d. Knowle Rosie 33122 by Knowle Darlington 32687.*

Class 362.—Tamworth Boars, born in 1923.

- 2974 **I. (10, & R. N. for Champion²).—F. W. HOLT**, The Grove, Withaw, Erdington, Birmingham, for *Sunbeam Squire* (T.N. 20), born Jan. 6; *s. Knowle Neptune 30027, d. Milton Pearl by Mons of Middleton 25775.*
 2975 **II. (25).—ROBERT IBBOTSON**, Knowle, Dorridge, Birmingham, for boar (T.N. 513), born Jan. 10; *s. Knowle Bruce 36013, d. Knowle Favour 38024 by Knowle Dracnought 28119.*

Class 363.—Tamworth Breeding Sows, born in or before 1921.

- 2977 **I. (10, R. N. for Champion,³ & Champion⁴).—ROBERT IBBOTSON**, Knowle, Dorridge, Birmingham, for *Knowle Favour 38004* (T.N. 232), born Jan. 6, 1921, farrowed Jan. 10; *s. Knowle Dracnought 28419, d. Knowle Fashion 63902 by Knowle Arundel 21855.*
 2978 **II. (25).—ROBERT IBBOTSON**, for *Knowle Model 19th 70292* (T.N. 188), born Aug. 2, 1920, farrowed Jan. 12; *s. Basildon Max 25683, d. Knowle Model 10th 52048 by Knowle Arundel 21855.*
 2979 **III. (23).—ROBERT IBBOTSON**, for *Knowle Venus 76210* (T.N. 128), born Dec. 8, 1919, farrowed March 6; *s. Basildon Max 25683, d. Knowle Beatrice 12th 52038 by Knowle Ashdown 21857.*
 2981 **R. N.—MAJOR J. A. MORRISON**, D.S.O., Basildon Park, Goring, Reading, for *Basildon Golden Queen 6th.*

¹ Prizes given by the National Pig Breeders' Association.

² Champion Gold Medal given by the National Pig Breeders' Association for the best Tamworth Boar in Classes 360–362.

³ Silver Challenge Cup, value Thirty Guineas, given by the National Pig Breeders' Association for the best Tamworth Pig in Classes 360–364.

⁴ Champion Gold Medal given by the National Pig Breeders' Association for the best Tamworth Sow in Classes 363 and 364.

CXX *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

Class 364.—*Tamworth Sows, born in 1922.*

- 2983 I. (£10, & R. N. for Champion.¹)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading, for *Basildon Barbara* (T.N. 179), born Jan. 2; s. Knowle Darlington 32657, d. Beauty of Milton 70080 by Mons of Middleton 25775.
 2983 II. (£5.)—ROBERT IBBOTSON, Knowle, Dorridge, Birmingham, for sow (T.N. 448), born July 12; s. Knowle Bruce 36013, d. Knowle Myrtle 88100 by Knowle Dreadnought 28419.
 2982 III. (£3.)—ROBERT IBBOTSON, for Knowle Model 21st (T.N. 418), born March 7; s. Knowle Alkshipman 36025, d. Knowle Model 19th 76202 by Basildon Max 25683.

Class 365.—*Three Tamworth Sows, born in 1923.*

- 2985 I. (£10.)—ROBERT IBBOTSON, Knowle, Dorridge, Birmingham, for sows, born Jan. 10; s. Knowle Bruce 36013, d. Knowle Favour 88094 by Knowle Dreadnought 28419.
 2986 II. (£3.)—ROBERT IBBOTSON, for sows, born March 6; s. Knowle Joseph, d. Knowle Queen Mary 88118 by Knowle Darlington 32657.

Berkshires.

Class 366.—*Berkshire Boars, born in or before 1921.*

- 2989 I. (£10, & R. N. for Champion.¹)—E. R. DEBENHAM, Bladen Dairy Farms, Driffield, Dorchester, for *Bryanston Prince* (T.N. 132), born Oct. 22, 1919, bred by Viscount Portman, Bryanston, Blandford; s. Samuel P. 21349, d. Joan 21864 by Manor Menarch 19251.
 2993 II. (£5.)—W. SLOUGH, Oakdene, Byng Road, High Barnet, Herts, for *Basildon Onward* 24553, born Aug. 2, 1920, bred by Major J. A. Morrison, Basildon Park, Reading; s. Hurry Onward 22033, d. Basildon Juvenal 26717 by Goldilocks Rob 20126.
 2992 III. (£3.)—JAMES NAGLE, Stonebenge Pedigree Stock Farm, Amesbury, Wilts, for *Pamber President* 22702, born April 10, 1920; s. Minley King 18364, d. Compton Guest 20188 by Manor Baronet 18978.
 2991 R. N.—ALFRED C. KING, Braishfield Manor, Romsey, Hants, for *Manor Masterpiece*.

Class 367.—*Berkshire Boars, born in 1922, before July 1.*²

- 2998 I. (£10, Champion.² & Champion.⁴)—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, for *Sutton Regent* 322, born March 20, bred by Julius Pricker, Marsh Farm, Stalbridge, Dorset; s. Heale War Lunn 24172, d. Princess Royal 5th 19665 by Motcombe Cognac 16665.
 2994 II. (£5.)—H. R. BEETON, Hammonds, Checkendon, Reading, for *Hammonds Bonny Lad*, born April 26; s. Curry On, d. Eaton Bonny Belle.
 3002 III. (£3.)—FRANK TOWNSEND, Highfield, Moor Allerton, Leeds, for *Highfield Royal President* 3rd 340, born June 1; s. Pamber President 22702, d. Eaton Princess Royal 3rd 22450 by Manor Record 20276.
 2990 R. N.—SIR HUGO M. FITZHERBERT, Bt., Kingstone Lisle, Wantage, for *Tissington Prince* 2nd.
 H. C.—2995. C.—2997.

Class 368.—*Berkshire Boars, born in 1922, on or after July 1.*³

- 3000 I. (£10.)—THE EARL OF HAREWOOD, Harewood House, Harewood, Leeds, for *Harewood Baron* B. 400, born July 26; s. Braishfield Baronet 23033, d. Harewood Diamond S. 111 by Murrell Jolly Boy 21924.
 3006 II. (£5.)—THE HON. LOUIS G. GREVILLE, Heale House, Woodford, Salisbury, for *Heale Megalos* B. 464, born July 13; s. Badminton Megaphone 24513, d. Heale Lunn 1st 24174 by War Loan 18694.
 3012 III. (£3.)—JAMES NAGLE, Stonebenge Pedigree Stock Farm, Amesbury, Wilts, for *Heale Buck* 2nd B. 441, born July 17, bred by the Hon. Louis Greville, Heale House, Woodford, Salisbury; s. Manor Duckmaster 22554, d. Sister Meg 21069 by Hurry On 19635.
 3016 R. N.—FRIEND SYKES, Rickings Park, Colnbrook, Bucks, for *Rickings Prince Diamond*.
 H. C.—3005, 3010.

¹ Champion Gold Medal given by the National Pig Breeders' Association for the best Tamworth Sow in Classes 363 and 364.

² Challenge Cup, value Twenty Guinea, given by the British Berkshire Society for the best Berkshire Boar in Classes 366-369.

³ Prizes given by the British Berkshire Society.

⁴ The "Eaton" Silver Challenge Cup, value Fifty Guinea, given through the British Berkshire Society for the best Boar or Sow in Classes 366-372. A Gold Medal was given by the British Berkshire Society to the Breeder of this Champion Pig.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. cxxi

Class 369.—Berkshire Boars, born in 1923.

- 3028 I. (110).—LADY LUGARD, Little Parkhurst, Abinger Common, Dorking, for boar, born Jan. 2; s. Kingstone Forester B. 31, d. Abinger Violet 25534 by Abinger Gardiner 21956.
 3019 II. (25).—LORD BOLTON, Bolton Hall, Leyburn, for Wensley True Boy 2nd, born Jan. 9; s. Eaton True Boy 22488, d. Wensley Harkwood 25970 by Heale War Lunn 24172.
 3018 III. (23).—LORD BOLTON, for Wensley Polymagnus, born Feb. 16; s. Pamber Polymagnus 25728, d. Pamber Pretty Maid 25753 by Pamber President 22702.
 3002 R. N.—W. F. SHERIFF, Ascuts, Hatfield, for Ascuts Bisto.
 H. C.—3025, 3029, d.—3017.

Class 370.—Berkshire Breeding Sows, born in or before 1921

- 3448 I. (110, & R. N. for Champion).—FRANK TOWNEND, Highfield, Moor Allerton, Leeds, for Braishfield Baroness 150, born Aug. 20, 1920, farrowed Jan. 28, bred by A. C. King, Romsey; s. Braishfield Berners 23038, d. Braishfield Brilliant 23084 by Whitley Royal Standard 20558.
 3039 II. (25).—LADY LUGARD, Little Parkhurst, Abinger Common, Dorking, for Abinger Vacity 23713, born March 20, 1920, farrowed March 1; s. Kingstone Peacemaker 21339, d. Baglan Vanity 20522 by Whitley Wiseman 13044.
 3040 III. (23).—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Goring, Reading, for Suddon Princess Royal 26140, born March 17, 1921, farrowed March 5, bred by Julius Fricker, Marsh Farm, Stalbridge, Dorset; s. Manor Buckmaster 22554, d. Princess Royal 5th 19695 by Motcombe Cognac 16605.
 3037 R. N.—THE HON. LOUIS G. GREVILLE, Heale House, Woodford, Salisbury, for Heale Lunn Ist.
 H. C.—3033, 3042.

Class 371.—Berkshire Sows, born in 1922, before July 1.

- 3066 I. (110).—JAMES NAGLE, Stonehenge Pedigree Stock Farm, Amesbury, Wilts, for Theale Ruby S. 1021, born March 5, bred by W. J. Cumber, Thual, Berks; s. Carry On 21191, d. Forest Ruby 25415 by Whitley O.K. 20499.
 3065 II. (25).—JAMES NAGLE, for Beenharn Virgo S. 1301, born Jan. 3, bred by G. W. Layley, Hiltrop Farm, Beenharn, Reading; s. Murrell Puzzle 24033, d. Sefton Virgo 20658 by Links Surly 19483.
 3056 III. (23).—S. F. EDGE'S PIC FARMS, LTD., Gallops Estate Office, Ditchling, Sussex, for Miss Dainty 2nd, born March 20, bred by J. Fricker, Marsh Farm, Stalbridge, Dorset; s. Heale War Lunn 24172, d. Princess Royal 5th 19695 by Motcombe Cognac 16605.
 3061 R. N.—H. B. BRETON, Hammonds, Cheekendon, Reading, for Hammonds Highbrow.
 H. C.—3056, 3061, 3067, 3072.

Class 372.—Berkshire Sows, born in 1922, on or after July 1.*

- 3083 I. (110).—THE HON. LOUIS G. GREVILLE, Heale House, Woodford, Salisbury, for Heale Miss Meg 2nd S. 1887, born July 17; s. Manor Buckmaster 22554, d. Sister Meg 21069 by Hurry On 19635.
 3082 II. (25).—THE HON. LOUIS G. GREVILLE, for Heale Miss Meg S. 1886, born July 20; s. Manor Buckmaster 22554, d. Sister Meg 21069 by Hurry On 19635.
 3037 III. (23).—THE EXORS. OF THE LATE W. HOWARD PALMER, Stokes Farm, Wokingham, Berks, for Murrell Princess, born July 1, bred by the late W. Howard Palmer, Stokes Farm; s. Murrell Prince 20332, d. Murrell Annie 19974 by Minley King 18364.
 3079 R. N.—R. W. CARSON, Halse, Brackley, for Forest Daisy,
 H. C.—3080, 3086, 3090.

Class 373.—Three Berkshire Sows, born in 1923.

- 3090 I. (110).—LADY LUGARD, Little Parkhurst, Abinger Common, Dorking, for sows, born Jan. 2; s. Abinger Jake B. 283, d. Baglan Rose 20527 by Whitley Wiseman 13044.
 3094 II. (25).—SIR HUGH M. FITZHERBERT, BT., Kingstone Lisle, Wantage, for Tislington Pride's 1931, Tislington Poppy's 1932 and Tislington Pattie's 1933, born Jan. 12; s. Kingstone President B. 43, d. Tislington Amy 5th 24864 by The Viscount 19056.
 3092 III. (23).—E. R. DEBENHAM, Bladen Dairy Farms, Brixton, Dorchester, for sows, born Jan. 20, bred by E. R. Vincent, The Manor Farm, Waterton, Dorchester; s. Biddenden Beau B. 111, d. Compton Vanity by Ivorne Firework 24542.
 3063 R. N.—LIEUT. COLONEL J. A. DUNNINGTON-JEFFERSON, D.S.O., Thicket Priory, York, for Thicket Dono Lunn, Thicket Dono Lunn 2nd and Thicket Dainty Lunn.
 H. C.—3095, 3097.
 Cup.—LADY LUGARD.
 R. N. for Cup.—JAMES NAGLE.

* The "Eaton" Silver Challenge Cup, value Fifty Guineas, given through the British Berkshire Society for the best Boar or Sow in Classes 366-372. A Gold Medal was given by the British Berkshire Society to the Breeder of this Champion Pig.
 * Prizes given by the British Berkshire Society.
 * The "Berkshire" Silver Challenge Cup, value £20, given through the British Berkshire Society for the most points awarded in a combination of entries in Classes 366-373 on the basis of: Four points for a first prize, three points for a second prize, two points for a third prize, one point for a fourth prize, two points for a Championship, and one point for a Reserve for a Championship.

Large Blacks.

Class 374.—*Large Black Boars, born in or before 1921.*

- 3110 I. (£10, & Champion.¹)—JOHN H. GLOVER, Cornwood, Devon, for *Meana Sunstar* 19023, born July 5, 1920, bred by W. S. Ward, Menna, Grampound Road, Cornwall; *s. Rising Hero* 19241, *d. Fentongollan Perfection* 26378 by *Traveglos Leader* 3rd 6015.
 3106 II. (£5, & R. N. for Champion.)—ALEXANDER P. COCKBURN, Stanborough, Halwill, Devon, for *Awton Sampson* 21891, born March 7, 1921, bred by G. H. Beaton, O.B.F., Shepleigh Court, Blackawton, Devon; *s. Cornwood Confessor* 12967, *d. Drayton Hajdke* 33556 by *Loughtor Marvel* 4437.
 3120 III. (£3.)—JOHN WARNE, Tregonhayne, Tregoncy, Grampound Road, Cornwall, for *Valley Result* 15335, born Sept. 5, 1920, bred by J. C. Oliver, Woodland Valley, Ladock, Grampound Road; *s. Fentongollan Result* 9585, *d. Beauty of the Valley* 40th 2564 by *Valley Togo* 4673.
 3105 R. N.—THOMAS BERRROWS, Brook Farm, Ufculme, Devon, for *Awton Major*.
 H. C.—3100, 3119. C.—3101, 3108.

Class 375.—*Large Black Boars, born in 1922, before July 1.²*

- 3130 I. (£10.)—STUART NUTHALL, Runtley Farm, Sutton Green, Guildford, for *Runtley Ruler* 23707, born March 29; *s. Cornwood Marvel* 2nd 15331, *d. Witham Victory* 2nd 55649 by *Whiteford Ranger* 11621.
 3126 II. (£5.)—W. L. HOSKING & SONS, Fentongollan, Merther, Probus, Cornwall, for *Fentongollan Escort* 23919, born May 10; *s. Fentongollan Victor* 2nd 21425, *d. Fentongollan Eclipse* 65310 by *Fentongollan Rising Star* 9587.
 3123 III. (£3.)—BEN E. BRIGHTON, Hawthorn Hill, Dogdyke, Lincoln, for *Hawthorn Double* 1st 22099, born Jan. 25; *s. Hawthorn Hero* 13033, *d. Argos Vahan Hawthorn* 3rd 2749 by *Argos Dun John* 6843.
 3131 R. N.—JOHN C. OLVER, Woodland Valley, Ladock, Cornwall, for *Valley General*.

Class 376.—*Large Black Boars, born in 1922, on or after July 1.³*

- 3139 I. (£10.)—WILLIAM BRACEY, Manor House, Martham, Great Yarmouth, for *Martham Premier* 25459, born July 17; *s. Martham What's Wanted* 15283, *d. Awton Victorinus* 1st 46816 by *Cornwood King John* 8271.
 3160 II. (£5.)—ALFRED PLAYLE, Basingbourn, Cambs, for *Basingbourn Squire* 25290, born July 15; *s. Cornwood Luftenthal Naik* 13691, *d. Basingbourn Countess* 1st 20332 by *Cleave General* 6367.
 3148 III. (£3.)—W. L. HOSKING & SONS, Fentongollan, Merther, Probus, Cornwall, for *Fentongollan Result* 3rd 25179, born Aug. 18; *s. Fentongollan Result* 2nd 21881, *d. Tavisquite Victory* 11th 30334 by *Restrongtun Pioneer* 6907.
 3159 R. N.—ALFRED PLAYLE, for *Basingbourn Senator*.
 H. C.—3168. C.—3140, 3151, 3157, 3158.

Class 377.—*Large Black Boars, born in 1923.*

- 3222 I. (£10.)—ALFRED PLAYLE, Basingbourn, Cambs, for *Basingbourn Hopetol* 26153, born Jan. 2; *s. Luftenthal Saladin* 19939, *d. Basingbourn Lady Nora* 19678 by *Kedleston Ringleader* 15851.
 3189 II. (£5.)—ALEXANDER P. COCKBURN, Stanborough, Halwill, Devon, for *Brent Boy* 26833, born Jan. 28, bred by H. J. Kingwell, Bow Farm, Totnes; *s. Hewas General* 14903, *d. Brent Sunflower* 27th 42648 by *Heathcot Rectangle* 4855.
 3240 III. (£3.)—WALTER J. WARREN, Dracons Farm, Staplegrave, Taunton, for *Kibber Royalist* 25779, born Jan. 2; *s. Vahan Jack* 5th 13845, *d. Trull Dusky Queen* 2nd 8229 by *Basingbourn Squire* 9053.
 3204 R. N.—W. L. HOSKING & SONS, Fentongollan, Merther, Probus, for *Fentongollan Rajah* 2nd.
 H. C.—3184, 3199, 3203, 3221, 3224, 3228.
 C.—3192, 3195, 3206, 3220, 3225, 3228, 3236, 3237, 3239.

Class 378.—*Large Black Breeding Sows, born in or before 1921.*

- 3262 I. (£10, & R. N. for Champion.)—JOHN WARNE, Tregonhayne, Grampound Road, Cornwall, for *Traveglos Lass* 20th A. 44732, born Feb. 16, 1920, farrowed Jan. 12; *s. Vahan Melva* 2nd 5691, *d. Traveglos Lass* 12th 23870 by *Valley None Such* 5401.
 3250 II. (£5.)—JOHN H. GLOVER, Cornwood, Devon, for *Cornwood Ozarina* 43006, born May 10, 1920, farrowed March 9; *s. Fentongollan Naik* 9455, *d. Cornwood Woodside* 2749 by *Alford Victor* 2nd 6841.
 3240 III. (£3.)—F. P. BROWN, Kingston Farm, Chilton, Isle of Wight, for *Kingston Blackie* 27276, born April 15, 1919, farrowed Feb. 3; *s. Drayton Kingston* 6903, *d. Drayton Lady Newport* 1st 18616 by *Basingbourn Cliff* 6337.
 3251 R. N.—G. A. GOONCHILD, Great Yeldham, Essex, for *Tartar Queen* 15th.
 H. C.—3242, 3243, 3244, 3249, 3258, 3263.
 C.—3253, 3254, 3256, 3266.

¹ Champion Prize of £10 given by the Large Black Pig Society for the best Boar in Classes 374-377.

² Prizes given by the Large Black Pig Society.

³ Silver Challenge Cup, value Twenty Guineas, given by the Large Black Pig Society for the best Sow in Classes 378-380.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. cxxiii

Class 379.—Large Black Sows, born in 1922, before July 1.

- 3268 I. (£10, & Champion).¹—HARRY E. BASTARD, Tinten Manor, St. Tudy, Cornwall, for Tinten Black Bess 43rd 73420, born Jan. 4; s. Witham Tiptree 1st 11104, d. Tinten Black Bess 21st 17232 by Boss of the Valley 2855.
 3262 II. (£5).—JAMES PUTNAM, Farringdon, Exeter, for Cornwood Lass 67th 90960, born March 3, bred by J. H. Glover, Cornwall; s. Rialton Hero 13241, d. Cornwall Lass 54th 38322 by Fentongollan Nalk 9455.
 3263 III. (£3).—ALFRED FLAYLE, Basingbourn, Cambs, for Salsote Ladybird 7th 5032, born Jan. 2, bred by P. B. May, Heybridge, Maldon, Essex; s. Basingbourn Rhinoceros 14627, d. Salsote Ladybird 3rd 53361 by Basingbourn Achilles 1st 14075.
 3270 R. N.—THOMAS BURROWS, Brook Farm, Uffculme, Devon, for Brook Lass 44th. H. C.—3272, 3283, 3292, 3297, 3303, 3304. C.—3269, 3270, 3273, 3277, 3284, 3285, 3296, 3298, 3295, 3305.

Class 380.—Large Black Sows, born in 1922, on or after July 1.²

- 3324 I. (£10).—MISS KAY-MOUAT, Firs Farm, Malvern Wells, for McHenther Susan 2nd 97250, born July 2; s. Maxwellton Black Prince 30th 20361, d. McHenther Lady Sooty 2nd 38500 by Cleave Victor 9711.
 3327 II. (£5).—HARRY E. BASTARD, Tinten Manor, St. Tudy, Cornwall, for Tinten Daffodil 6th 93882, born July 3; s. Westpetherwin Chief 1st 14433, d. Tinten Black Bess 40th 35736 by Fentongollan Lad 10567.
 3328 III. (£3).—WILLIAM WILLS, Marlwood, Thornbury, Glos, for Lustleigh Merrythought 24494, born July 8; s. Bywell Arrow 13857, d. Vahan Merrythought 11588 by Trevisquite Vahan 4845.
 3332 R. N.—CHARLES TODD, College Farm, Swineshead, Boston, Lincs, for Swineshead Cauton 2nd. H. C.—3312, 3328, 3329, 3334, 3335. C.—3308, 3319, 3320, 3325, 3336, 3337.

Class 381.—Three Large Black Sows, born in 1923.

- 3359 I. (£10).—THOMAS WARNE, Trevisquite Manor, St. Malyn, Cornwall, for Trevisquite Leveidas 72nd 10236, Trevisquite Leveidas 74th 10128 and Trevisquite Leveidas 75th 101280, born Jan. 6; s. Hendra Trevisquite 2nd 10903, d. Trevisquite Leveidas 19 B 41034 by Moorland Principal 7753.
 3340 II. (£5).—HARRY E. BASTARD, Tinten Manor, St. Tudy, Cornwall, for Tinten Primrose 1st 99024, Tinten Primrose 2nd 99026, Tinten Primrose 3rd 99028, born Jan. 7; s. Rialton Hero 13241, d. Tinten Black Bess 37th 48128 by Trevisquite Pastoulin 7973.
 3344 III. (£3).—F. P. BROWN, Kingston Farm, Chilton, Isle of Wight, for Kingston Jeannette 102052, Kingston Isabel 102054 and Kingston Jean 102056, born Jan. 2; s. Swineshead Hero 1st 22109, d. Kingston Diligent 31466 by Trevisquite Surprise 9583.
 3352 R. N.—CAPTAIN PERCY MUSKER, Roudham Hall, Mablethorpe, for Roudham Rotundity, Roudham Minerva and Roudham Gaiety. H. C.—3346, 3351, 3353. C.—3348, 3350, 3354, 3356, 3358.

Gloucestershire Old Spots.³

Class 382.—Gloucestershire Old Spots Bows, born in or before 1921.

- 3362 I. (£10, Champion,⁴ & Champion).⁵—STANLEY H. BADOCK, Holmwood, Westbury-on-Trym, Bristol, for Holmwood Dauntless 4275, born March 7, 1921; s. Ashton Bloomer 1741, d. Clevehill Beauty 11327 by Sultan 4th of Hollywood Tower 401.
 3373 II. (£5).—F. B. RYDER, Taughham Hall, Hakeney, Norfolk, for Smokey Ben 2nd 4511, born March 30, 1911, bred by L. G. Collett, Mole House, Evesham, Worcs; s. Winterbourne Tom 1196, d. Birdlip Bantam 4224 by Birdlip Spot 96.
 3369 III. (£3).—THE EXORS. OF THE LATE A. R. PILKINGTON, Windle Hall Farm, St. Helens, for Windle Acker 3403, born April 22, 1920; s. Olney Wonder 1792, d. Windle Ambition 4993 by Pitham Chapple 900.
 3361 R. N.—C. ALINGTON, Little Barford, St. Neots, for Kingswood Yeoman. H. C.—3373.

Class 383.—Gloucestershire Old Spots Bows, born in 1922, before July 1.

- 3380 I. (£15).—LEOPOLD G. COLLETT, Mere House, Evesham, for Smokey Apollo 4978, born Jan. 9; s. Almsbury Apollo 4978, d. Smokey Rose 9478 by Naisa Lad 731.
 3380 II. (£10).—TOM WELLS, The Manor Dairy, Galphay, Ripon, for Galphay Non-Such, born June 4; s. Rhella Major 3978, d. Galphay Bountiful 12568 by Sp. King Major 1683.

¹ Silver Challenge Cup, value Twenty Guineas, given by the Large Black Pig Society for the best Sow in Classes 378-380.

² Prizes given by the Large Black Pig Society.

³ £100 towards these Prizes were given by the Gloucestershire Old Spots Pig Society.

⁴ Silver Challenge Cup, value Twenty Guineas, given through the Gloucestershire Old Spots Pig Society for the Best Boar in Classes 382-385.

⁵ Silver Challenge Cup, value Forty Guineas, given through the Gloucestershire Old Spots Pig Society for the best Boar or Sow in Classes 382-385.

ccxiv *Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923.*

- 3383 III. (45.)—MAJOR HERBERT MUSKER, O.B.E., Rushford Hall, Thetford, for *Braziers Jester* 4818, born Jan. 5, bred by J. W. Noble, Westhorpe, Stowmarket; s. *Star* *Ensign* Harlequin 2847, d. *Braziers Annex* 3695 by *Beccles* Commander 742.
3389 R. N.—F. HAROLD TURNBULL, Lower House Farm, Llantwit Major, Cardiff, for *Downside* Major.

Class 384.—Gloucestershire Old Spots Boars, born in 1922, on or after July 1.

- 3400 I. (112.)—MRS. LLOYD, Croydon Rectory, Royston, Herts, for *Dolanoothy King Solomon* 5188, born Aug. 8; s. *Chalfont Pilot* 4064, d. *Bromley Lady Godiva* 6th 16307 by *Shaw Lane Duke*.
3394 II. (48.)—MISS B. G. CORY-WRIGHT, Ayot Place, Welwyn, Herts, for *Ayot Page* *Jeep*, born Aug. 22; s. *Chalfont Pilot* 4064, d. *Croxton Fiction* 16th 7340 by *Hobwell Monarch* 1028.
3398 III. (45.)—SIR F. HERVEY-BATHURST, Bt., D.S.O., Somborne Park, Winchester, for *Somborne Star* 5140, born Nov. 23; s. *Somborne Reserve* 4823, d. *Pylewell Beauty* 13675 by *Ashton Bloomer* 1741.
3402 R. N.—THE EXORS. OF THE LATE A. R. PILKINGTON, Windle Hall Farm, St. Helens, for *Ichham Heather Jock*.
H. C.—3401, 3403, 3405.

Class 385.—Gloucestershire Old Spots Boars, born in 1923.

- 3407 I. (112, & R. N. for Champion.)—STANLEY H. BADOCK, Holmwood, Westbury-on-Trym, Bristol, for *Holmwood Master* 5149, born Jan. 4; s. *Woodstock Henry* 4123, s. *Holmwood Lily of the Valley* 15612 by *Ashton Bloomer* 1741.
3409 II. (48.)—EDWARD CAUDWELL, Rowsley Hall Farm, Derbyshire, for *Peakland Major*, born Jan. 2; s. *Crank Major* 4244, d. *Wychnor Fancy* 4th 44 by *Rhyd Duke*.
3416 III. (45.)—SHERRIFF & SONS, Lemsford, Hatfield, Herts, for *Nashes Premier* 1st, born Jan. 14; s. *Ayot Premier* 4721, d. *Nashes Blossom* 1st 15317 by *Nashes Duke* 3094.
3417 R. N.—JOHN H. THOMAS, Cuddeph Court, Spetchley, Worcester, for *Gilslake Charlie*.
H. C.—3420.

Class 386.—Gloucestershire Old Spots Breeding Sows, born in or before 1921.

- 3430 I. (110, R. N. for Champion, & Champion.)—HENRY MATTHEWS, Down Farm, Winterbourne, Bristol, for *Thornbury Ballet Girl* 13710, born June 18, 1921, farrowed Jan. 23, bred by Bennett and Howard, Thornbury, Glos; s. *Ashton Bloomer* 1741, d. *Thornbury Begum* 3941 by *Gilslake Admiral* 907.
3437 II. (45.)—THE EXORS. OF THE LATE A. R. PILKINGTON, Windle Hall Farm, St. Helens, Lancs, for *Windle Prim* 13459, born March 3, 1921, farrowed Jan. 7; s. *Odley Wonder* 1792, d. *Windle Pride* 4513 by *Collingwood Jumbo* 543.
3439 III. (43.)—HERBERT JAMES STAFF, Hall Farm, Redgrave Dis, for *Redgrave Jewess* 1st 14813, born Jan. 4, 1921, farrowed March 2; s. *Fatchway Monarch* 1233, d. *Williamstrip Janet* 2nd 423 by *Williamstrip King William* 8th.
3431 R. N.—MAJOR HERBERT MUSKER, O.B.E., Rushford Hall, Thetford, for *Thornbury Buckle*.
H. C.—3436, 3438.

Class 387.—Gloucestershire Old Spots Sows, born in 1922, before July 1.

- 3447 I. (115, & R. N. for Champion.)—BENNETT & HOWARD, Quarry Farm, Thornbury, Glos, for *Thornbury Beetle* 2nd 15905, born Jan. 10; s. *Ashton Bloomer* 1741, d. *Thornbury Beetle* 5236 by *Battleborough Prince* 627.
3457 II. (110.)—SHERRIFF & SONS, Lemsford, Hatfield, Herts, for *Nashes Duchess* 16th 16227, born March 13; s. *Gilslake Soldier* 3127, d. *Nashes Duchess* 3rd 13890 by *Harlequin of Hollywood Tower* 911.
3449 III. (45.)—MISS B. G. CORY-WRIGHT, Ayot Place, Welwyn, Herts, for *Ayot Polyanthus* 15866, born Feb. 9; s. *Bromley Duke* 2001, d. *Croxton Fiction* 16th 7340 by *Hobwell Monarch* 1028.
3446 R. N.—BENNETT & HOWARD, for *Thornbury Beaver*.
H. C.—3453.

Class 388.—Gloucestershire Old Spots Sows, born in 1922, on or after July 1.

- 3470 I. (112.)—MISS B. G. CORY-WRIGHT, Ayot Place, Welwyn, Herts, for *Ayot Pearl* 16707, born Aug. 22; s. *Chalfont Pilot* 4064, d. *Croxton Fiction* 16th 7340 by *Hobwell Monarch* 1028.
3472 II. (48.)—MRS. LLOYD, Croydon Rectory, Royston, Herts, for *Dolanoothy Queen of Sheba* 15993, born Aug. 6; s. *Chalfont Pilot* 4064, d. *Bromley Lady Godiva* 6th 16307 by *Shaw Lane Duke* 3070.

¹ Silver Challenge Cup, value Twenty Guinea, given through the Gloucestershire Old Spots Pig Society for the best Boar in Classes 382-385.

² Silver Challenge Cup, value Forty Guinea, given through the Gloucestershire Old Spots Pig Society for the best Boar or Sow in Classes 382-388.

³ Silver Challenge Cup, value Twenty Guinea, given through the Gloucestershire Old Spots Pig Society for the best Sow in Classes 386-388.

Awards of Live Stock Prizes at Newcastle-on-Tyne, 1923. cxxv

- 3473 **III. (45.)**—**HENRY MATTHEWS**, Down Farm, Winterbourne, Bristol, for **Cleahill Maggie** 16734, born July 1, bred by Henry Bridgman, Cleahill Farm, Dowwood, Bristol; *s.* Frenchay Forester 4125, *d.* Clapote Loyalty 3rd 9265 by Coombe Commander 1st 2161.
- 3474 **R. N.**—**SHERIFF & SONS**, Lemsford, Hatfield, Herts, for **Nashes Duchess** 15th.
H. C.—3476.

Class 389.—*Three Gloucestershire Old Spots Sows, born in 1923.*

- 3478 **I. (512.)**—**BENNETT & HOWARD**, Quarry Farm, Thornbury, Glas, for **Thornbury Butrow**, **Thornbury Bounty** and **Thornbury Barrow**, born Jan. 15; *s.* Ashton Bloomer 1741, *d.* Thornbury Beale 5238 by Battleborough Prince 627.
- 3480 **II. (48.)**—**SHERIFF & SONS**, Lemsford, Hatfield, Herts, for **Nashes Blossom 8th**, **Nashes Blossom 9th** and **Nashes Blossom 10th**, born Jan. 24; *s.* Ayot Premier 4721, *d.* Nashes Blossom 3rd 15319 by Nashes Duke 3068.
- 3477 **III. (45.)**—**STANLEY H. BADOCK**, Holmwood, Westbury-on-Trym, Bristol, for **Holmwood Mistress** 17018, **Holmwood Mistress** 17017 and **Holmwood Lady** 17016, born Jan. 4; *s.* Woodstock Henry 4100, *d.* Holmwood Lily of the Valley 15612 by Ashton Bloomer 1741.
- 3481 **R. N.**—**HERBERT JAMES STAFF**, Hall Farm, Redgrave, Diss, for **Princess 1st**, **Princess 2nd** and **Princess 3rd**.
H. C.—3484.

Lincolnshire Curly-Coated.

Class 390.—*Lincolnshire Curly-Coated Boars, born in or before 1922.*

- 3486 **I. (510, & Champion.)**—**F. J. CAWDWELL**, Manor House, Sibsey, Boston, Lincs, for **Bold Prince** 2nd 4643 (T.N. 133), born Jan. 23, 1921, bred by W. Abbott, Swanton, Billingsborough, Lincs; *s.* Poxton Prince 4103, *d.* Bold Evolution by Carrington Grange Evolution 2nd 1339.
- 3485 **II. (45.)**—**FREDERICK E. BOWSER**, Wigtoft, Boston, Lincs, for **Fishtoft Leader** 4575, born Feb. 9, 1921, bred by Arthur Clifton, Wigtoft, Boston; *s.* Burton Haigh 4463, *d.* Fishtoft Abundance 12092 by Wigtoft Grandee 3925.

Class 391.—*Lincolnshire Curly-Coated Boars, born in 1923.*¹

- 3492 **I. (510, & R. N. for Champion.)**—**GERSHOM SIMPSON**, Lowdham, Notts, for boar (T.N. 87), born Jan. 12; *s.* Caythorpe Dob 4487, *d.* Charnwood Jewel 26th 12650 by Wigtoft Charnwood 4361.
- 3488 **II. (45.)**—**FREDERICK E. BOWSER**, Wigtoft, Boston, Lincs, for boar (T.N. 920), born Jan. 3; *s.* Fishtoft Leader 4575, *d.* Wigtoft Helen 3rd 12154 by Carrington Grange Mascot 2nd 4287.
- 3491 **R. N.**—**GEORGE FREIR**, Toleshope House, Deeping St. Nicholas, Spalding, for **Deeping Ashleaf** 3rd.
H. C.—3489.

Class 392.—*Lincolnshire Curly-Coated Breeding Sows, born in or before 1921.*

- 3498 **I. (510, & Champion.)**—**GERSHOM SIMPSON**, Lowdham, Notts, for **Charnwood Jewel** 26th 12650 (T.N. 903), born Jan. 4, 1921, farrowed Jan. 12; *s.* Wigtoft Charnwood 4361, *d.* Charnwood Jewel 15th 11890 by Keal Dick 3801.
- 3490 **II. (45.)**—**F. J. CAWDWELL**, Manor House, Sibsey, Boston, Lincs, for **Midville Lass** 12080 (T.N. 76), born Jan. 23, 1921, farrowed April 4; *s.* Burton Lass 4153, *d.* Midville Beauty 23rd 11818 by Curly Marshman 3971.
- 3500 **R. N.**—**W. R. WILLIAMSON**, Vine Cottage, West Banks, Sleaford, for **Sleaford Painted Lady**.
H. C.—3499.

Class 393.—*Lincolnshire Curly-Coated Sows, born in 1922.*

- 3504 **I. (510, & R. N. for Champion.)**—**GEORGE FREIR**, Toleshope House, Deeping St. Nicholas, Spalding, for **Deeping Violet** 1st, born Jan. 20, bred by F. Richardson, Bourne Fen, Bourne, Lincs; *s.* Deeping Royal 1st 4153, *d.* Twenty Violets by Deeping Bolt King 4087.
- 3502 **II. (45.)**—**FREDERICK E. BOWSER**, Wigtoft, Boston, Lincs, for **Wigtoft 5th** 12160, born Feb. 12; *s.* Carrington Grange Mascot 2nd 4387, *d.* Wigtoft Mercur 12164 by Charnwood Peacemaker 2nd 4207.
- 3503 **R. N.**—**F. J. CAWDWELL**, Manor House, Sibsey, Boston, Lincs, for **Midville Lady** 1st.
H. C.—3505.

¹ Champion Prize of £5 5s. given by the Lincolnshire Curly-Coated Pig Breeders' Association for the best Boar in Classes 390 and 391.

² Prizes given by the Lincolnshire Curly-Coated Pig Breeders' Association.

³ Champion Prize of £5 5s. given by the Lincolnshire Curly-Coated Pig Breeders' Association for the best Sow in Classes 392 and 393.

Class 394.—Three Lincolnshire Curly-Coated Sows, born in 1923.

- 3509 I. (**£10.**)—FREDERICK E. BOWSER, Wigton, Boston, Lincs, for sows, born Jan. 3; *s.* Fishtoft Leader 4575, *d.* Wigton Helen 3rd 12154 by Carrington Grange Mascot Stud 4287.
 3510 II. (**£5.**)—HAROLD H. BOWSER, The Holmes, Kilton Holme, Boston, Lincs, for *Holmes Pride's* 28th, 27th and 28th, born Jan. 3; *s.* Fishtoft Leader 3rd 4575, *d.* Holmes Pride 5th 12324 by Caythorpe Bob 4487.
 3508 R. N.—WILLIAM ABBOTT, Swaton, Billingham, Lincs.
 H. C.—3513.

Cumberland.

Class 395.—Cumberland Boars, born in or before 1922.

- 3516 I. (**£10. & Champion.**)—WILLIAM PARKIN-MOORE, Whitehall, Mealsgate, Cumberland, for Wyndham Hero 3998, born Oct. 10, 1921, bred by R. Muse, Brocklebank, Wigton, Cumberland; *s.* Caisley King 1726, *d.* Molly 2523 by Tristram Shandy 429.
 3519 II. (**£5.**)—JOHN STEEL, M.R.C.V.S., Southley, Wigton, for Royal Fortune 3023 (T.N. C.24), born Jan. 30, 1921; *s.* Royal 1254, *d.* Dorothy of Beckstone Gate 1280 by Abel 2nd 1172.
 3514 III. (**£3.**)—SIR JOHN ANDERSON, BT., Dykehead, Blackford, Carlisle, for Standsley Viscount (T.N. N.92), born Oct. 8, 1922, bred by Mr. Bowerbank, Penrith; *s.* First Grade 1753, *d.* Madge 13th by Phillip of Faud 1534.
 3520 R. N.—ALBERT WIGNOTMAN, Middle Herrington Dairy Farm, Sunderland, for Gladiator of Blackcombe (T.N. D.15), born July 7, 1922, bred by J. Kerr, Red Hall, Wigton; *s.* Volway Hero, *d.* Red Hall Daisy by Kikibride Minor 1792.
 H. C.—3517.

Class 396.—Cumberland Boars, born in 1923.*

- 3523 I. (**£10. & R. N. for Champion.**)—JOHN S. JORDAN, Bowston, Kendal, for Bowston Model (T.N. E.7), born Jan. 20; *d.* Janet 2nd 4169 by Squire of Aikton.
 3528 II. (**£5.**)—JOHN STEEL, M.R.C.V.S., Southley, Wigton, for Southley White Swell (T.N. S.L.J. E.17), born Jan. 24; *s.* Royal Fortune 3023, *d.* Southley White Bud 2694 by Tristram Shandy 429.
 3524 III. (**£3.**)—JOHN S. JORDAN, for Bowston Monarch (T.N. E.11), born Jan. 26; *s.* Southley Gold Gain, *d.* Barclose Orphan Girl 3452 by Parton Height 1242.
 3525 R. N.—JOHN S. JORDAN, for Bowston President.
 H. C.—3530. C.—3532.

Class 397.—Cumberland Breeding Sows, born in or before 1921.

- 3537 I. (**£10. & Champion.**)—JOHN S. JORDAN, Bowston, Kendal, for Janet 2nd 4169 (T.N. C.8), born March 5, 1921, farrowed Jan. 20, bred by J. B. Threlkeld, Ashes, Wigton; *s.* Squire of Aikton, *d.* Witch of Aikton 1294 by Prince Thomas of Aikton House 400.
 3539 II. (**£5.**)—JOHN ROTTENBER, Old Silloth Dairy, Silloth, Cumberland, for Seabreeze of Old Silloth 2651, born March 20, 1919, farrowed Feb. 13, bred by the late John Slack, Blitterlees, Silloth, Cumberland; *s.* Wolsty King 764, *d.* Blitterlees Peggy 1074.
 3540 III. (**£3.**)—JOHN STEEL, M.R.C.V.S., Southley, Wigton, for Conceit 1600 (T.N. S.L.J. A.5), born Jan. 26, 1919, farrowed Feb. 10; *s.* His Nibs 696, *d.* Giddy Girl 608 by Oughterside 57.
 3538 R. N.—WILLIAM PARKIN-MOORE, Whitehall, Mealsgate, Cumberland, for Ervie Curkiss.
 H. C.—3543. C.—3535, 3536.

Class 398.—Cumberland Sows, born in 1922.

- 3554 I. (**£10. & R. N. for Champion.**)—JOHN STEEL, M.R.C.V.S., Southley, Wigton, for Southley Soubricque 1969 (T.N. S.L.J. D. 14), born Jan. 28; *s.* Gold Mine 1708, *d.* Southley Bloom 2603 by Tristram Shandy 429.
 3553 II. (**£5.**)—JOHN STEEL, M.R.C.V.S., for Southley Silver Urn 4367 (T.N. S.L.J. D.15), born Jan. 28; *s.* Gold Mine 1708, *d.* Southley Bloom 2603 by Tristram Shandy 429.
 3552 III. (**£3.**)—JOHN STEEL, M.R.C.V.S., for Southley Silver Corn 4366 (T.N. S.L.J. D.15), born Jan. 28; *s.* Gold Mine 1708, *d.* Southley Bloom 2603 by Tristram Shandy 429.
 3549 R. N.—JOHN S. JORDAN, Bowston, Kendal, for Lonning Nan.
 H. C.—3550. C.—3551.

Class 399.—Three Cumberland Sows, born in 1923.

- 3559 I. (**£10.**)—JOHN S. JORDAN, Bowston, Kendal, for sows, born Jan. 26; *s.* Southley Gold Gain, *d.* Barclose Orphan Girl 3453 by Parton Height 1242.
 3560 II. (**£5.**)—JOHN STEEL, M.R.C.V.S., Southley, Wigton, for Southley You You, Souther Cos and Southley Quits, born Jan. 22 and 24; *s.* Royal Fortune 3023, *da.* Skittles 704 by Lord Rowkes 1808, Southley White Bud 2694 by Tristram Shandy 429, and Southley Fish Girl 10th 3711 by Lord Rowkes 1808.
 3558 III. (**£3.**)—JOHN S. JORDAN, for sows, born Feb. 6; *s.* Parton Height 1243, *d.* Seabreeze Sally 1634 by Lord Riches 702.
 3562 R. N.—WILLIAM WHITE, Prestwick Hall, Ponteland, Newcastle-on-Tyne.
 H. C.—3557. C.—3561, 3563.

* Champion Prize of £5 given by the Cumberland Pig Breeders' Association for the best Boar in Classes 395 and 396.

* Prizes given by the Cumberland Pig Breeders' Association.

* Champion Prize of £5 given by the Cumberland Pig Breeders' Association for the best Sow in Classes 397 and 398.

Wessex Saddlebacks.

Class 400.—*Wessex Saddleback Boars, born in or before 1921.*

- 3567 I. (*#10, & Champion*).¹—T. L. MARTIN, Ashe Warren House, Overton, Hants, for *Ashe Plant* 2nd 650, born Jan. 29, 1921; s. *Ashe Plant* 72, d. *Caer Girdle* 438 by *Caer King-maker* 9.
 3566 II. (*#5*).—T. L. MARTIN, for *Ashe Mac* 2nd 689, born Feb. 2, 1921; s. *Holbury Lancer* 190, d. *Ashe Mercy* 243 by *Melchet Cooper* 2.
 3564 R. N.—MAJOR ARTHUR BREWIS, Polhampton, Overton, Hants, for *Norman Polham*.
 H. C.—3565.

Class 401.—*Wessex Saddleback Boars, born in 1922.*²

- 3574 I. (*#10*).—SIR W. G. WATSON, BT., Sulhamstead Park, Reading, for *Oakley Master* 1265, born March 6, bred by Major Brewis, Polhampton, Overton, Hants; s. *Norman Polham* 661, d. *Oakley Mary* 244 by *Melchet Cooper* 2.
 3573 II. (*#5*).—DOLPHIN SMITH, Mackrey Fend, Harpenden, for *Harpenden True Type* 1464, born Aug. 3; s. *Norman King Offa* 219, d. *Romsey True Type* 820.
 3570 R. N.—DR. WILLIAM H. FORSHAW, Slythelhurst, Ewhurst, Guildford, for *Slythelhurst Forest King*.
 H. C.—3572.

Class 402.—*Wessex Saddleback Boars, born in 1923.*

- 3585 I. (*#10*).—STANLEY WHITE, Offley Grange, Hitchin, for *Offa Hero*, born Jan. 2; s. *Offa Emperor* 1170, d. *Offa Agatha* 1713 by *Norman King Offa* 219.
 3577 II. (*#5*).—DR. WILLIAM H. FORSHAW, Slythelhurst, Ewhurst, Guildford, for *Slythelhurst Robin Hood* 1693, born Jan. 12; s. *Slythelhurst Royal Oak* 934, d. *Slythelhurst Bracken* 4838 by *Ashe Mac* 2nd 680.
 3587 R. N.—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for *Sherwood Success*.
 H. C.—3576. C.—3586.

Class 403.—*Wessex Saddleback Breeding Sows, born in or before 1921.*

- 3588 I. (*#10, & R. N. for Champion*).¹—T. L. MARTIN, Ashe Warren House, Overton, Hants, for *Ashe Mercy* 2nd 2638, born Feb. 2, 1921, farrowed May 1; s. *Holbury Lancer* 190, d. *Ashe Mercy* 243 by *Melchet Cooper* 2.
 3581 II. (*#5*).—STANLEY WHITE, Offley Grange, Hitchin, for *Offa Frea* 2707, born March 9, 1921, farrowed April 2; s. *Norman King Offa* 219, d. *Crofton of Brighton* 294 by *Duke of Brighton* 22.
 3589 R. N.—T. L. MARTIN, for *Pride of Ashe* 2nd.

Class 404.—*Wessex Saddleback Sows, born in 1922.*²

- 3599 I. (*#10*).—DR. WILLIAM H. FORSHAW, Slythelhurst, Ewhurst, Guildford, for *Slythelhurst Bracken* 4838, born Jan. 21; s. *Ashe Mac* 2nd 680, d. *Shillingley Blossom* 659 by *Hew-shott King* 33.
 3596 II. (*#5*).—MAJOR ARTHUR BREWIS, Polhampton, Overton, Hants, for *Oakley Mary* 2nd 4929, born March 6; s. *Norman Polham* 661, d. *Oakley Mary* 244 by *Melchet Cooper* 2.
 3608 R. N.—STANLEY WHITE, Offley Grange, Hitchin, for *Offa Nitrate* 1st.
 H. C.—3607.

Class 405.—*Three Wessex Saddleback Sows, born in 1923.*

- 3609 I. (*#10*).—MAJOR ARTHUR BREWIS, Polhampton, Overton, Hants, for *Oakley Stonia* 2nd 7316, *Oakley Stonia* 3rd 7317 and *Oakley Salutation* 7314, born Jan. 1; s. *Norman Polham* 661, d. *Oakley Stonia* 1551.
 3615 II. (*#5*).—STANLEY WHITE, Offley Grange, Hitchin, for *Offa Success* 1st and 2nd, and *Offa Sunshine*, born Jan. 2; s. *Offa Canute* 125 and *Norman King Offa*, s. *Offa John* 4845 by *Offa Edmund* 471 and *Crofton of Brighton*.
 3610 R. N.—DR. WILLIAM H. FORSHAW, Slythelhurst, Ewhurst, Guildford, for *Slythelhurst Maid Marion*, *Shamrock* of *Slythelhurst* and *Sunshine* of *Slythelhurst*.
 H. C.—3611. C.—3614.

¹ Silver Challenge Cup, value Fifty Guineas, given by the Wessex Saddleback Pig Society for the best Boar or Sow in Classes 400-404. A Silver Medal is given by the Wessex Saddleback Pig Society to the Breeder of the Champion Pig.

² Prizes given by the Wessex Saddleback Pig Society.

Essex.

Class 406.—*Essex Boars, born in or before 1921.*

- 3619 I. (£10.)—J. REGINALD TINNEY, Church End Farm, Rickling, Newport, Essex, for **Barnston Reigner** 771 (T.N. 2521), born Jan. 10, 1921, bred by A. and H. Turner, Barnston Hall, Dunmow, Essex; s. Barnston Baron 151, d. Barnston Regan 928.
 3616 II. (£5.)—A. J. COUSINS, Cressing Lodge, Braintree, for **Tillyfour Angus** 811 (T.N. 3321), born July 4, 1921, bred by A. McCombie, Feistead, Essex; s. Rutlands Ruiss 487, d. Tillyfour Kathleen 2570 by Porters Record 445.
 3618 R. N.—EDWARD H. SYKES, Fryerning Grange, Ingatstone, for **Fryerning Claudius** 1st.

Class 407.—*Essex Boars, born in 1922.¹*

- 3620 I. (£10. & Champion.)—ASHTON, MACLURE & SYKES, Fryerning Grange, Ingatstone, for **Walden Generosity**, born Jan. 19, bred by A. T. Groenlade, Little Walden Park, Saffron Walden; s. Chelmer Archbishop 789, d. Walden Treasure 2nd 3920 by Walden General 539.
 3623 II. (£5.)—W. A. ROBINSON, Egerton Hall, Malpas, for **Brook Masterpiece** 18th 143 (T.N. 5750), born Aug. 17, bred by R. Browning-Smith, The Brook, Great Tey, Essex; s. Brook Masterpiece 215, d. Brook Kashmir Girl 1138 by Pound Chief.
 3624 R. N.—WALTER C. V. SCHWIER, Tewes Farm, Little Sampford, Braintree, for **Brook Masterpiece** 8th.
 H. C.—3261.

Class 408.—*Essex Boars, born in 1923.*

- 3638 I. (£10.)—W. LAWRENCE TAYLOR, Gallywood, Chelmsford, for **Gallywood Emperor** 2nd 523, born Jan. 2; s. Fryerning Farmer 617, d. Ashington Queen 4864 by Pound Chief 113.
 3633 II. (£5.)—EDWARD H. SYKES, Fryerning Grange, Ingatstone, for boar, born Jan. 2; s. Fryerning Claudius 1st 845, d. Fryerning Folly 3rd 3184 by Barnston Claudius 1st 7.
 3637 R. N.—R. BROWNING SMITH, The Brook, Great Tey, Kelvedon, for **Brook Masterpiece** 22nd.

Class 409.—*Essex Breeding Sows, born in or before 1921.*

- 3644 I. (£10.)—C. W. and J. PARKER, Bradwell-on-Sea, Southminster, for **Chelmer Celia** 4236, born Nov. 20, 1920, farrowed Jan. 12, bred by Hon. Mrs. Hoare, Cecil House, Brentwood; s. Barnston Claudius 7, d. Proud Sarah 602.
 3639 II. (£5.)—A. J. COUSINS, Cressing Lodge, Braintree, for **Cressing Duchess** 2nd 3040 (T.N. 2438), born Jan. 9, 1921, farrowed Feb. 21; s. Westfield Beau 547, d. Cressing Duchess 1308 by Laguna Champion 55.
 3649 R. N.—W. LAWRENCE TAYLOR, Gallywood, Chelmsford, for **Ashington Queen**.
 H. C.—3640.

Class 410.—*Essex Sows, born in 1922.¹*

- 3656 I. (£10. & R. N. for Champion.)—KEMSLEY & KEMSLEY, Great Wakering, Essex, for **Barling Countess** 6642 (T.N. 4687), born July 25; s. Chelmer Cornsack 745, d. Barling What's Wanted 4182 by Landwick King George 349.
 3650 II. (£5.)—A. J. COUSINS, Cressing Lodge, Braintree, for **Cressing Hope** 5th 7182 (T.N. 4982), born July 4; s. Govers Jupiter 897, d. Cressing Hope 2nd 4950 by Westfield Beau 547.
 3657 R. N.—KEMSLEY & KEMSLEY, for **Barling Diamond**.
 H. C.—3650.

Class 411.—*Three Essex Sows, born in 1923.*

- 3668 I. (£10.)—WALTER C. V. SCHWIER, Tewes Farm, Little Sampford, Braintree, for **Sows** born Jan. 4; s. Brook Masterpiece 8th, d. Emma of Tewes 3812.
 3667 II. (£5.)—C. W. and J. PARKER, Bradwell-on-Sea, Southminster, for **Bradwell Peppanthus** 2nd 8080, **Bradwell Poppy** 2nd 8082, **Bradwell Nellie** 2nd 8094, born Jan. 2 and 3; s. Fosse Daniel 497, d. Bradwell Mary 1090 by Broxsted Duke 17, and Bradwell Belle 1070 by Broxsted Duke 17.
 3665 R. N.—CHARLES COUSINS, Junkins, Stisted, Braintree.
 H. C.—3670.

¹ Prizes given by the Essex Pig Society.

² Champion Cup, value Ten Guineas, given by the Essex Pig Society for the best Boar of Sow in Classes 406-410.

POULTRY.

By "Cock," "Hen," "Gander," and "Goose," are meant birds hatched previous to January 1, 1923; and by "Cockerel" and "Pullet" are meant birds hatched in 1923.

The Prizes in each Class are as follows: **First Prize, 30s. Second Prize, 20s. Third Prize, 10s.**

Special Prizes were given in the Poultry Classes by the following Clubs:—Dorking, Sussex, White Wyandotte, Columbian Wyandotte, Buff Orpington, British Rhode Island Red, Barred Plymouth Rock, Buff Plymouth Rock, Indian Runner Duck, and Buff Orpington Duck.

Class 412.—*Dorking Cocks.*

- 1 I. & Special.—CHARLES AITKENHEAD, Carr House Farm, New Seaham.
- 2 II.—A. J. MAJOR, Ditton, Langley, Bucks.
- 3 III.—GEORGE H. PROCTER, Flass House, Durham.
- 6 R.N.—R. GILBERT, Primrose House, Clitheroe.

Class 413.—*Dorking Hens.*

- 9 I. & R.N. for Special.—BIRG-GEN. E. W. BAIRD, Reedyloch, Edrom, Berwickshire.
- 12 II. & Special.—CHARLES AITKENHEAD, Carr House Farm, New Seaham.
- 14 III.—A. J. MAJOR, Ditton, Langley, Bucks.
- 10 R. N.—J.S.O. MEIRLE, Camrigan, Girvan, Ayrshire.

Class 414.—*Dorking Cockerels.*

- 16 I. & R. N. for Special.—THOMAS BRIDEN, Cononley, Keighley.
- 20 II.—CHARLES AITKENHEAD, Carr House Farm, New Seaham.
- 17 III.—A. J. MAJOR, Ditton, Langley, Bucks.
- 18 R. N.—BIRG-GEN. E. W. BAIRD, Reedyloch, Edrom, Berwickshire.
H. C.—19, 21.

Class 415.—*Dorking Pullets.*

- 27 I.—CHARLES AITKENHEAD, Carr House Farm, New Seaham.
- 28 II.—BIRG-GEN. E. W. BAIRD, Reedyloch, Edrom, Berwickshire.
- 29 III.—THOMAS BRIDEN, Cononley, Keighley.
- 20 R. N.—A. J. MAJOR, Ditton, Langley, Bucks.
H. C.—23. C.—24.

Class 416.—*Langshan Cocks or Cockerels.*

- 34 I. & 30 III.—JOSEPH HOWE, Grosvenor Hotel, Blackpool.
- 33 II.—ERNEST WATSON, Castle House, Barnard Castle.
- 32 R. N.—R. TWIGG, Clipsehead, Bradbourne, Ashbourne.
H. C.—31.

Class 417.—*Langshan Hens or Pullets.*

- 37 I. & 40 II.—JOSEPH HOWE, Grosvenor Hotel, Blackpool.
- 36 III.—R. TWIGG, Clipsehead, Bradbourne, Ashbourne.
- 39 R. N.—R. FLETCHER HEARNshaw, Fox Hill, Burton Joyce, Notts.

Class 418.—*Croad Langshan Cocks or Cockerels.*

- 49 I.—CROSSLEY SYKES, Home Park Poultry Farm, Musselburgh.
- 52 II.—MRS. W. B. GOODE, Aldborough Lodge, Bournemouth.
- 48 III.—PARK HOUSE POULTRY FARM, Burstow, Surrey.
- 53 R. N.—THOMAS RICHARDS, 17 Church Street, Loughhead.
H. C.—44, 45, 51. C.—47.

Class 419.—*Croad Langshan Hens or Pullets.*

- 50 I.—EDWARD COCKER, 101 Towngate, Leyland.
- 63 II.—HENRY HESLOP, Low House Farm, Nately, Kirkby Stephen.
- 54 III.—MISS MARGARET ROBINSON, Clay House, Walton, Wrexham.
- 55 R. N.—C. G. LINDLEY, Gate House Farm, Hurstlepoint.
H. C.—56, 60, 64.

Class 420.—*Brahma Cocks or Cockerels.*

- 65 I.—G. W. HENSHALL, The Hollies, Timperley, Cheshire.
- 67 II.—THE REV. C. M. STICKINGS, Ronton Vicarage, Haughton, Staffs.

Class 421.—*Brahma Hens or Pullets.*

- 68 I.—MRS. W. THOMPSON, Old Chitwell, Notts.
- 69 II.—THE REV. C. M. STICKINGS, Ronton Vicarage, Haughton, Staffs.

cxxx *Awards of Poultry Prizes at Newcastle-on-Tyne, 1923.*

Class 422.—Cochin Cocks or Cockerels.

- 73 I, 71 III. & 74 R. N.—GEORGE H. PROCTER, Flass House, Durham.
72 II.—TOM H. FURNESS, Carlton House, Chesterfield.

Class 423.—Cochin Hens or Pullets.

- 79 I, 75 II. & 77 R. N.—GEORGE H. PROCTER, Flass House, Durham.
76 III.—TOM H. FURNESS, Carlton House, Chesterfield.

Class 424.—Light Sussex Cocks.

- 93 I, Special & Cup. & 84 III.—JAMES RUSSEL, Mapleton, Edenbridge.
85 II.—F. M. ROGERS, Wanbarrow Poultry Farm, Hurstpierpoint.
86 R. N.—MRS. M. A. GRANT, Westlands, Horley, Surrey.
H. C.—80, 90, 95, 99. C.—87.

Class 425.—Light Sussex Hens.

- 114 I.—JAMES RUSSEL, Mapleton, Edenbridge.
109 II.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.
111 III.—F. M. ROGERS, Wanbarrow Poultry Farm, Hurstpierpoint.
118 R. N.—R. A. MRECKEL, Kingswood Poultry Farm, Warlingham.
H. C.—101, 105, 106, 116. C.—109.

Class 426.—Light Sussex Cockerels.

- 123 I. & R. N. for Special & R. N. for Cup.—MRS. M. A. GRANT, Westlands, Horley.
126 II.—C. N. GOODE, The Haydens, Blisoe, Bedford.
121 III.—R. SCOTT MILLER, Clydenok Poultry Farm, Uddingston, Glasgow.
130 R. N.—A. J. FALKENSTEIN, Rookhurst, Rotherfield, Sussex.
H. C.—129, 135, 137, 138, 139. C.—124.

Class 427.—Light Sussex Pullets.

- 151 I.—JAMES RUSSEL, Mapleton, Edenbridge.
159 II.—MRS. M. A. GRANT, Westlands, Horley, Surrey.
149 III.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.
157 R. N.—GEORGEY SPENCER, Roedby Poultry Farm, Bexhill-on-Sea.
H. C.—143, 149, 150, 156, 161. C.—145, 152.

Class 428.—Speckled Sussex Cocks.

- 168 I. & R. N. for Special.—DR. E. S. JACKSON, Carnforth.
172 II.—CAPT. T. M. WHITTAKER, Pen-y-Bryn, Portmadoc.
162 III.—JAMES RUSSEL, Mapleton, Edenbridge.
160 R. N.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.
H. C.—165, 167, 169. C.—170.

Class 429.—Speckled Sussex Hens.

- 174 I.—SIR JAMES KNOTT, BT., Close House Home Farm, Wylam-on-Tyne.
176 II.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.
178 III.—DR. E. S. JACKSON, Carnforth.
181 R. N.—A. J. FALKENSTEIN, Rookhurst, Rotherfield.
H. C.—182, 183.

Class 430.—Speckled Sussex Cockerels.

- 190 I.—MRS. M. A. GRANT, Westlands, Horley, Surrey.
189 II. & 185 III.—JAMES RUSSEL, Mapleton, Edenbridge.
187 R. N.—A. J. FALKENSTEIN, Rookhurst, Rotherfield.
H. C.—186.

Class 431.—Speckled Sussex Pullets.

- 198 I. & Special, 194 II. & 199 III.—JAMES RUSSEL, Mapleton, Edenbridge.
193 R. N.—A. J. FALKENSTEIN, Rookhurst, Rotherfield.
H. C.—195, 196. C.—191.

Class 432.—Sussex Cocks, any other colour.

- 204 I. & R. N. for Special.—JAMES RUSSEL, Mapleton, Edenbridge.
203 II.—LEONARD LUCAS, Broadmead Poultry Farm, Dursley, Surrey.
200 III.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.
201 R. N.—FLETCHWOOD ASHBURNHAM, Guestings, Hastings.
H. C.—202. C.—206.

Class 433.—Sussex Hens, any other colour.

- 209 I. & Special.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.
210 II.—A. J. FALKENSTEIN, Rookhurst, Rotherfield.
213 III.—JAMES RUSSEL, Mapleton, Edenbridge.
215 R. N.—H. ELDRINGHAM, 119 Durham Road, Blackhill.
H. C.—211, 216. C.—212.

Awards of Poultry Prizes at Newcastle-on-Tyne, 1923. cxxxii

Class 434.—*Sussex Cockerels, any other colour.*

- 218 I. & 222 II.—MRS. M. A. GRANT, Westland, Horley, Surrey.
 217 III.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.
 219 E. N.—HAROLD MARSHALL, Bramshott Manor, Liphook.
 H. C.—221. C.—223.

Class 435.—*Sussex Pullets, any other colour.*

- 224 I.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.
 225 II.—FLETCHWOOD ASBURNHAM, Guestlings, Hastings.
 223 III.—MRS. M. A. GRANT, Westlands, Horley, Surrey.
 226 E. N.—HAROLD MARSHALL, Bramshott Manor, Liphook.
 H. C.—225. C.—223.

Class 436.—*Campine Cocks or Cockerels.*

- 236 I.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.
 231 II. & 234 E. N.—LT.-COL. W. G. LUCAS, Beech Place, Stowmarket.
 233 III.—LAWRENCE DUKE, Oaker, Mallock.
 H. C.—230, 235.

Class 437.—*Campine Hens or Pullets.*

- 241 I.—TOM H. FURNESS, Carlton House, Chesterfield.
 245 II.—LT.-COL. W. G. LUCAS, Beech Place, Stowmarket.
 247 III.—MRS. M. E. COOKE, The Grange Poultry Farm, Tenbury.
 242 E. N.—T. E. HARRISON & SONS, Darrass Hall Poultry Farm, Ponteland, Newcastle-on-Tyne.
 H. C.—239, 240, 243. C.—246.

Class 438.—*White Wyandotte Cocks.*

- 252 I.—TOM H. FURNESS, Carlton House, Chesterfield.
 249 II.—C. N. GOODE, The Haydens, Bletsoe, Bedford.
 248 III.—LORD DEWAR, Homestall Poultry Farm, East Grinstead.
 253 E. N.—GRASSYNOOK POULTRY FARM, Two-Mile-Houses, Stockton-on-Tees.
 H. C.—250. C.—254.

Class 439.—*White Wyandotte Hens.*

- 259 I.—LORD DEWAR, Homestall Poultry Farm, East Grinstead.
 263 II.—MRS. A. M. BARKER, Prospect House, Lanchester.
 260 III.—TOM H. FURNESS, Carlton House, Chesterfield.
 266 E. N.—CAPT. J. R. RENWICK, Auburn Hill, Malton.
 H. C.—262. C.—264.

Class 440.—*White Wyandotte Cockerels.*

- 270 I. & Special.—JOHN WHARTON, Honeycott Farm, Hawes, Yorks.
 269 II. & E. N. for Special.—C. N. GOODE, The Haydens, Bletsoe, Bedford.
 267 III.—LORD DEWAR, Homestall Poultry Farm, East Grinstead.
 274 E. N.—PARK HOUSE POULTRY FARM, Burstow, Surrey.
 H. C.—275. C.—268, 273.

Class 441.—*White Wyandotte Pullets.*

- 282 I. & Special.—GRASSYNOOK POULTRY FARM, Two-Mile-Houses, Stockton-on-Tees.
 283 II. & E. N. for Special.—JOHN WHARTON, Honeycott Farm, Hawes, Yorks.
 280 III.—C. N. GOODE, The Haydens, Bletsoe, Bedford.
 289 E. N.—WILFRED DOWSON, Windmill, Bishop Auckland.
 H. C.—284, 287. C.—283.

Class 442.—*Black Wyandotte Cocks or Cockerels.*

- 292 I.—ROGER HARGREAVES, Abbeydene Poultry Farm, Whalley, Lancs.
 290 II.—RALPH FORSTER, Post Office, Dawdon, Seaham Harbour.
 291 III.—WALTON MAUGHAN, Ing Head House, Holnith, Yorks.

Class 443.—*Black Wyandotte Hens or Pullets.*

- 294 I.—ROGER HARGREAVES, Abbeydene Poultry Farm, Whalley, Lancs.
 293 II.—TOM H. FURNESS, Carlton House, Chesterfield.

Class 444.—*Gold or Silver Laced Wyandotte Cocks or Cockerels.*

- 298 I. & 301 E. N.—J. G. MORTEN, Pentrich, Derby.
 299 II.—WILLIAM RICHARDSON, 13 Bootham Crescent, York.
 296 III.—TOM H. FURNESS, Carlton House, Chesterfield.
 H. C.—300. C.—297.

cxxxii *Awards of Poultry Prizes at Newcastle-on-Tyne, 1923.*

Class 445.—Gold or Silver Laced Wyandotte Hens or Pullets.

- 302 I.—GEORGE HARDY, Pickering Lodge, Timperley, Cheshire.
 304 II. & 309 R. N.—THOMAS LOCKWOOD, The Woodlands, Pateley Bridge, Harrogate.
 305 III.—TOM H. FURNISS, Carlton House, Chesterfield.
 H. C.—307. C.—306.

Class 446.—Columbian Wyandotte Cocks.

- 316 I.—E. L. FRANK, 9 Mount Ephraim, Tunbridge Wells.
 311 II.—CAPT. J. R. RENWICK, Auburn Hill, Malton.
 313 III. & R. N. for Special.—GEORGE HARDY, Pickering Lodge, Timperley.
 314 R. N.—HENRY HUNT, Cliffords Meane, Newent, Glos.
 H. C.—318. C.—315.

Class 447.—Columbian Wyandotte Hens.

- 321 I. & Special.—GEORGE HARDY, Pickering Lodge, Timperley.
 328 II.—CAPT. J. R. RENWICK, Auburn Hill, Malton.
 322 III.—L. H. WACE, Kingsland Poultry Farm, Beaminstor, Dorset.
 326 R. N.—E. L. FRANK, 9 Mount Ephraim, Tunbridge Wells.
 H. C.—327. C.—323.

Class 448.—Columbian Wyandotte Cockerels.

- 332 I. & Special, & 330 II.—GEORGE HARDY, Pickering Lodge, Timperley.
 331 III.—S. J. SHEPHERD, Roughton, Bridgnorth.
 329 R. N.—L. H. WACE, Kingsland Poultry Farm, Beaminstor.

Class 449.—Columbian Wyandotte Pullets.

- 334 I. & R. N. for Special & 337 II.—GEORGE HARDY, Pickering Lodge, Timperley.
 336 II.—W. R. READHEAD, Manor House, Flanborough.
 335 R. N.—S. J. SHEPHERD, Roughton, Bridgnorth.
 H. C.—338.

Class 450.—Wyandotte Cocks or Cockerels, any other colour.

- 343 I.—ROBERT DELL, Wetheral, Carlisle.
 341 II.—ALEC MACDONALD, Thornberry Farm, Bowes, Darlington.
 339 III.—W. H. BREWER, Azella Poultry Park, Lostwithiel.
 347 R. N.—W. LEAR, Howard Cottage, Wetheral, Carlisle.
 H. C.—340, 342. C.—345.

Class 451.—Wyandotte Hens or Pullets, any other colour.

- 349 I.—J. A. BOARDLEY, Slyde Road, Lancaster.
 345 II.—FRED ARGO, Brucktor Farm, Inverurie.
 350 III.—MRS. MICHAEL HARRISON, Shaw House, Wetheral, Carlisle.
 353 R. N.—ISAAC SPENCER, 50 Park Road, Eland, Yorks.
 H. C.—354. C.—352.

Class 452.—Buff Orpington Cocks.

- 358 I. & R. N. for Special.—T. M. ROGERS, Wanbarrow Poultry Farm, Hurstlerpoint.
 357 II.—GEORGE HARDY, Pickering Lodge, Timperley.
 359 III.—JOHN BROOKS, Myrtle Poultry Farm, Irlam, Manchester.
 355 R. N.—W. J. GOLDING, Bowens, Peshurst.
 H. C.—356. C.—360.

Class 453.—Buff Orpington Hens.

- 361 I.—R. N. WOODEND, Hill House Poultry Farm, Burton, Westmorland.
 363 II.—GEORGE H. BROOKER, Flax House, Durham.
 362 III.—T. M. ROGERS, Wanbarrow Poultry Farm, Hurstlerpoint.
 364 R. N.—W. J. GOLDING, Bowens, Peshurst.

Class 454.—Buff Orpington Cockerels.

- 365 I. & Special.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.
 368 II.—R. N. WOODEND, Hill House Poultry Farm, Burton.
 367 III. & 369 R. N.—W. J. GOLDING, Bowens, Peshurst.
 H. C.—368.

Class 455.—Buff Orpington Pullets.

- 370 I.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.
 373 II.—W. J. GOLDING, Bowens, Peshurst.
 374 III.—R. N. WOODEND, Hill House Poultry Farm.
 371 R. N.—J. WARREN, Burton Manor, Marnhull, Dorset.
 H. C.—375. C.—372.

Awards of Poultry Prizes at Newcastle-on-Tyne, 1923. CXXXIII

Class 456.—Black Orpington Cocks.

- 384 I.—JOHN BURDETT, Lake Bank Terrace, Wingate.
 386 II.—MRS. G. DAIRD, Colstoun, Haddington.
 388 III.—MR. AND MRS. JOHN LOWTHER, Rosbery House, Eighton Banks, Gateshead.
 390 R. N.—D. O. LYLES, Bank House, Ashton Road, Lancaster.
 H. C.—384. C.—378.

Class 457.—Black Orpington Hens.

- 389 I.—JOHN BURDETT, Lake Bank Terrace, Wingate.
 388 II.—GEOFFREY SPENCER, Redby Poultry Farm, Bechill.
 394 III.—MRS. G. DAIRD, Colstoun, Haddington.
 391 R. N.—MR. AND MRS. JOHN LOWTHER, Rosbery House, Eighton Banks, Gateshead.

Class 458.—Black Orpington Cockerels.

- 390 I.—CLAYTON & FORD TORHAN, The Laurels, Sessay, Thirsk.
 400 II.—J. WARREN, Burton Manor, Marshull, Dorset.
 402 III.—MESSRS. CURKAY, Patson Byres Farm, Mintofope.
 401 R. N.—MRS. M. A. BURDETT, 10, Lake Bank Terrace, Wingate.
 H. C.—398. C.—396.

Class 459.—Black Orpington Pullets.

- 405 I.—J. WARREN, Burton Manor, Marshull, Dorset.
 403 II.—JOHNS BROTHERS, Penwine, Helland, Bodmin.
 406 III. & 404 R. N.—MRS. M. A. BURDETT, 10, Lake Bank Terrace, Wingate.

Class 460.—Orpington Cocks, any other colour.

- 410 I.—MRS. G. DAIRD, Colstoun, Haddington.
 412 II.—J. WARREN, Burton Manor, Marshull, Dorset.
 407 III.—LADY WALEY COHEN, Caen Wood Towers Farm, Highgate.
 409 R. N.—LT.-COL. H. WATTS, Haslington Hall, Crewe.
 H. C.—411.

Class 461.—Orpington Hens, any other colour.

- 415 I.—GEORGE H. PROCTER, Flass House, Durham.
 414 II.—LORD DEWAR, Homestall Poultry Farm, East Grinstead.
 422 III.—MURRAY LINDNER, Ham Court, Charlton Kings, Cheltenham.
 416 R. N.—LT.-COL. H. WATTS, Haslington Hall, Crewe.
 H. C.—420. C.—418.

Class 462.—Orpington Cockerels, any other colour.

- 423 I.—GEORGE H. PROCTER, Flass House, Durham.
 426 II.—LT.-COL. H. WATTS, Haslington Hall, Crewe.
 425 III.—GEORGE DICKSON, Hollin Ridge, Wormald Green, Harrogate.
 424 R. N.—J. WARREN, Burton Manor, Marshull.

Class 463.—Orpington Pullets, any other colour.

- 420 I.—J. WARREN, Burton Manor, Marshull, Dorset.
 427 II.—LORD DEWAR, Homestall Poultry Farm, East Grinstead.
 430 III.—GEORGE DICKSON, Hollin Ridge, Wormald Green, Harrogate.
 428 R. N.—MURRAY LINDNER, Ham Court, Charlton Kings, Cheltenham.
 H. C.—436. C.—432.

Class 464.—British Rhode Island Red Single Comb Cocks.

- 439 I. & Special.—MISS MILDRED H. CLAY, Wenbury House, Plymouth.
 428 II.—MRS. ALLAN J. MOORE, Eightocks, Knutsford.
 443 III.—GEOFFREY SPENCER, Redby Poultry Farm, Bechill.
 435 R. N.—W. R. ABBEY, Croft Farm, Hessay, York.
 H. C.—434, 444, 451. C.—438, 446, 442.

Class 465.—British Rhode Island Red Single Comb Hens.

- 454 I.—T. C. CRAWFALL, Haveray Park, Kirk Hammeton, York.
 453 II.—JOHN DOUGLAS, 142, Hanham Road, Kingswood, Bristol.
 466 III.—J. B. BROADBENT, Welltholme, Brighouse.
 456 R. N.—MRS. ALLAN J. MOORE, Eightocks, Knutsford.
 H. C.—452, 461. C.—455.

Class 466.—British Rhode Island Red Single Comb Cockerels.

- 467 I. & R. N. for Special.—LADY VICTORIA MURRAY, Whiteley Hey, Presbury, Macclesfield.
 476 II.—R. E. MAISH, Swanwick, Alfreton.
 470 III.—MRS. ALLAN J. MOORE, Eightocks, Knutsford.
 479 R. N.—MAJOR H. B. DYKES, D.S.O., Dovenby Hall, Cockermouth.
 H. C.—469, 473. C.—468, 471, 473, 481.

cxix Awards of Poultry Prizes at Newcastle-on-Tyne, 1923.

Class 467.—British Rhode Island Red Single Comb Pullets.

- 492 I. & Special.—LADY VICTORIA MURRAY, Whiteley Hey, Prestbury, Macclesfield.
 502 II. & R. N. for Special.—MRS. W. B. GOODE, Aldborough Lodge, Boroughbridge.
 493 III.—MISS MILDRED H. CLAY, Wombury House, Plymstock.
 494 R. N.—RALPH FORSTER, Post Office, Dawdon, Seaham Harbour.
 H. C.—490, 494, 497, 503. C.—483, 487, 489, 500, 501, 506, 508, 512.

Class 468.—British Rhode Island Red Rose Comb Cocks.

- 510 I. & Special.—R. E. MARSH, Swanwick, Alfreton.
 515 II.—MISS MILDRED H. CLAY, Wombury House, Plymstock.
 518 III.—MRS. C. COLBECK, Boyle Hall, West Ardsley, Wakefield.
 517 R. N.—T. C. CRAWHALL, Haveray Park, Kirk Hammerton, York.
 H. C.—513, 514. C.—516.

Class 469.—British Rhode Island Red Rose Comb Hens.

- 520 I. & 525 III.—JOHN SPENCER, Market Place, Ashbourne.
 526 II.—R. E. MARSH, Swanwick, Alfreton.
 C.—524.

Class 470.—British Rhode Island Red Rose Comb Cockerels.

- 531 I.—R. E. MARSH, Swanwick, Alfreton.
 527 II.—MRS. C. COEDICE, Boyle Hall, West Ardsley, Wakefield.
 H. C.—530. C.—529.

Class 471.—British Rhode Island Red Rose Comb Pullets.

- 536 I. & R. N. for Special.—JOHN VOYCE, 3, Toleman Avenue, Beblington, Cheshire.
 538 II.—MISS MILDRED H. CLAY, Wombury House, Plymstock.
 535 III.—R. E. MARSH, Swanwick, Alfreton.
 534 R. N.—T. C. CRAWHALL, Haveray Park, Kirk Hammerton, York.
 H. C.—532, 539. C.—533.

Class 472.—Frizzles Cocks or Cockerels.

- 543 I.—MAJOR G. T. WILLIAMS, Tredrea, Perranwell.
 541 II. & 544 III.—SIR CLAUD ALEXANDER, BT., Faygate Wood, Faygate, Sussex.
 542 R. N.—MISS HILDA LAURIE, The West Gate House, Canterbury.
 H. C.—545.

Class 473.—Frizzles Hens or Pullets.

- 553 I. & 550 III.—MAJOR G. T. WILLIAMS, Tredrea, Perranwell.
 549 II. & 552 R. N.—SIR CLAUD ALEXANDER, BT., Faygate Wood, Faygate, Sussex.
 H. C.—548, 551.

Class 474.—Old English Game Black-Red Cocks or Cockerels.

- 556 I.—R. S. MARSDEN, Bridge House, Chatham, Clitheroe.
 558 II.—ARTHUR BROWN, The Old Hall, Hailington.
 561 III.—JOHN OLIVER, Threepwood Farm, Haydon Bridge.
 562 R. N.—JOHN MILLICAN, Scotty Lane, Scotty, Carlisle.
 H. C.—554, 560.

Class 475.—Old English Game Clay or Wheaten Hens or Pullets.

- 568 I.—R. S. MARSDEN, Bridge House, Chatham, Clitheroe.
 571 II.—W. H. HAMBLETON, Boyers Lodge Farm, Kirby Muxloe, Leicester.
 565 III.—JAMES NAGLE, Stonehenge Pedigree Stock Farm, Amesbury.
 564 R. N.—MISS MARY ANNIE REED, Low Cote Hill Farm, Carlisle.
 H. C.—563, 570.

Class 476.—Old English Game Cocks or Cockerels, any other colour.

- 575 I.—R. S. MARSDEN, Bridge House, Chatham, Clitheroe.
 578 II.—WILLIAM TELFORD, Breconside, Brampton Junction.
 576 III.—JOSEPH GRAVES, Station House, Fulgill.
 578 R. N.—JOHN WATSON, Eden Mount, Kendal.
 H. C.—572, 573. C.—580.

Class 477.—Old English Game Hens or Pullets, any other colour.

- 592 I.—WILLIAM TELFORD, Breconside, Brampton Junction.
 586 II.—JOHN WATSON, Eden Mount, Kendal.
 589 III.—R. S. MARSDEN, Bridge House, Chatham, Clitheroe.
 584 R. N.—T. H. EGGLESTONE, St. John's Chapel, Weardale.
 H. C.—587, 593, 594.

Awards of Poultry Prizes at Newcastle-on-Tyne, 1923. cxxxv

Class 478.—Indian Game Cocks or Cockerels.

- 595 I.—R. BELCHER, 9, Barrows Street, West Bromwich.
 597 II.—MAURICE MALCOLM, Doonemeadow, Stirling.
 596 III.—ABBOT BROTHERS, Thuxton, Norfolk.

Class 479.—Indian Game Hens or Pullets.

- 599 I.—R. S. MARSDEN, Bridge House, Chatham, Clitheroe.
 598 II.—CAPT. J. R. RENWICK, Auburn Hill, Malton.
 601 III.—R. BELCHER, 9, Barrows Street, West Bromwich.

Class 480.—Minorca Cocks or Cockerels.

- 602 I.—LORD DEWAR, Homestall Poultry Farm, East Grinstead.
 603 II.—WHITAKER & TOOTILL, Great Ouseburn, York.

Class 481.—Minorca Hens or Pullets.

- 604 I.—LORD DEWAR, Homestall Poultry Farm, East Grinstead.
 605 II.—RELF & LITTLE, 74, Milbourne Street, Carlisle.
 606 III.—WILLIAM J. SEWELL, Culgaith, Carlisle.
 607 R. N.—WILLIAM SIMPSON, Dene Lodge, Saltwell Park, Gateshead.

Class 482.—White Leghorn Cocks or Cockerels.

- 613 I. & 608 II.—LORD DEWAR, Homestall Poultry Farm, East Grinstead.
 611 III.—WHITAKER & TOOTILL, Great Ouseburn, York.
 609 R. N.—HERBERT SHORTER, Cottesbrook, Wyde Green, Birmingham.
 H. C.—619.

Class 483.—White Leghorn Hens or Pullets.

- 614 I.—LORD DEWAR, Homestall Poultry Farm, East Grinstead.
 617 II.—HERBERT SHORTER, Cottesbrook, Wyde Green, Birmingham.
 619 III.—DOGGERT & ANDREWS, School Hill, Histon, Cambridge.
 616 R. N.—GEOFFREY SPENCER, Reedy Poultry Farm, Bexhill.
 H. C.—615.

Class 484.—Black Leghorn Cocks or Cockerels.

- 620 I. & 622 II.—MRS. HARRY KENT, Stanbridge Poultry Farm, Hooe, Battle, Sussex.
 621 III.—MISS MCINTOSH, Wall Vearage, North Tyne.

Class 485.—Black Leghorn Hens or Pullets.

- 623 I. & 624 II.—MRS. HARRY KENT, Stanbridge Poultry Farm, Hooe, Battle, Sussex.

Class 486.—Leghorn Cocks or Cockerels, any other colour.

- 625 I.—LORD DEWAR, Homestall Poultry Farm, East Grinstead.
 626 II.—R. T. SERGEANT, Wootton, Uxbridge.

Class 487.—Leghorn Hens or Pullets, any other colour.

- 628 I.—A. R. FISH, Holme Mead, Hutton, Preston.
 630 II.—WILLIAM DEAN, JUN., 7, Rimmers Avenue, Freshfield, Liverpool.
 631 III.—J. W. PEACOCK, Holm Hill Farm, Chester Moor, Chester-le-Street.
 629 R. N.—CHARLES MIDDLEMASS, 9, Newgate Street, Morpeth.

Class 488.—Russian Orloff Cocks or Cockerels.

- 632 I.—MRS. C. COLBECK, Boyle Hall, West Ardsley, Wakefield.
 633 II.—JOHN SUTHERLAND, Tolbooth Lane, Wick, Cathness.

Class 489.—Russian Orloff Hens or Pullets.

- 635 I.—MRS. C. COLBECK, Boyle Hall, West Ardsley, Wakefield.
 636 II.—JOHN SUTHERLAND, Tolbooth Lane, Wick, Cathness.
 634 III.—MRS. ARTHUR SHERSTON, Otley Hall, Ipswich.

Class 490.—Gold or Silver Sicilian Buttercup Cocks or Cockerels.

- 640 I.—MRS. C. COLBECK, Boyle Hall, West Ardsley, Wakefield.
 638 II.—FRANK E. DERHAM, The Old Hall, Hilton, Derby.
 637 III.—MRS. ARTHUR SHERSTON, Otley Hall, Ipswich.

Class 491.—Gold or Silver Sicilian Buttercup Hens or Pullets.

- 644 I. & 642 II.—FRANK E. DERHAM, The Old Hall, Hilton, Derby.
 643 III.—MRS. C. COLBECK, Boyle Hall, West Ardsley, Wakefield.

cxxxvi *Awards of Poultry Prizes at Newcastle-on-Tyne, 1923.*

Class 492.—Brown Sicilian Buttercup Cocks or Cockerels.

- 646 I.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.
 648 II. & 645 III.—TOM A. SCOTT & Co., The Trenches, Slough.
 647 R. N.—FRANK E. DERHAM, The Old Hall, Hilton, Derby.

Class 493.—Brown Sicilian Buttercup Hens or Pullets.

- 650 I. & 652 III.—TOM A. SCOTT & Co., The Trenches, Slough.
 651 II.—FRANK E. DERHAM, The Old Hall, Hilton, Derby.
 649 R. N.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading.

Class 494.—Barred Plymouth Rock Cocks.

- 655 I. & R. N. for Special.—CAPT. J. R. RENWICK, Auburn Hill, Malton.
 657 II.—TOM GARDNER, The Poultry Farm, Bowgreave, Garstang.
 658 III.—DR. E. S. JACKSON, Carnforth.
 654 R. N.—WILLIAM SEATON, Greenlot, Caton, Lancaster.
 H. C.—653. C.—660.

Class 495.—Barred Plymouth Rock Hens.

- 666 I. & Special.—W. R. WILLIAMS, Carnforth.
 665 II. & 667 R. N.—CAPT. J. R. RENWICK, Auburn Hill, Malton.
 665 III.—DR. E. S. JACKSON, Carnforth.
 H. C.—664.

Class 496.—Barred Plymouth Rock Cockerels.

- 673 I.—W. R. WILLIAMS, Carnforth.
 669 II.—JAS. BATEMAN, Milnthorpe.
 674 III.—DR. E. S. JACKSON, Carnforth.
 679 R. N.—RICHARD MAKINSON, The Square, Burton, Carnforth.
 H. C.—678. C.—671.

Class 497.—Barred Plymouth Rock Pullets.

- 690 I.—RICHARD MAKINSON, The Square, Burton, Carnforth.
 681 II.—JAS. BATEMAN, Milnthorpe.
 680 III.—CAPT. J. R. RENWICK, Auburn Hill, Malton.
 689 R. N.—DR. E. S. JACKSON, Carnforth.
 H. C.—685. C.—682.

Class 498.—Buff Plymouth Rock Cocks or Cockerels.

- 699 I. & Special, & 695 III.—DR. E. S. JACKSON, Carnforth.
 697 II.—CAPT. J. R. RENWICK, Auburn Hill, Malton.
 696 R. N.—BILSEBOROUGH & BLAND, Park Lane Poultry Farm, Forton, Garstang.
 H. C.—692. C.—691.

Class 499.—Buff Plymouth Rock Hens or Pullets.

- 701 I. & R. N. for Special.—HERBERT SPENSLEY, Oaks Farm, Menston, Leeds.
 704 II.—DR. E. S. JACKSON, Carnforth.
 703 III.—JOHN TAYLOR, Heath Farm, Tiptree, Essex.
 709 R. N.—CAPT. J. R. RENWICK, Auburn Hill, Malton.
 H. C.—710. C.—705.

Class 500.—Ancona Cocks or Cockerels.

- 713 I.—C. HADDON JONES, Longfield, Tenbury.
 715 II.—ERNEST TREWHITT, Pallion Road Poultry Farm, Sunderland.
 716 III.—E. NEWALL, Gravel, Winsford.

Class 501.—Ancona Hens or Pullets.

- 720 I.—E. NEWALL, Gravel, Winsford.
 717 II.—HENRY HARTLEY, Seehole Cottage, Trawden, Culne.
 719 III.—J. S. INGHAM, Station House, Sedburgh.
 721 R. N.—ERNEST TREWHITT, Pallion Road Poultry Farm, Sunderland.
 H. C.—722.

Class 502.—Cocks or Cockerels, any other distinct variety, except Bantams.

- 733 I.—CAPT. J. R. RENWICK, Auburn Hill, Malton.
 739 II.—R. S. MARSHEN, Bridge House, Clatburn, Clitheroe, Ascal.
 726 III.—WILLIAM PICKERING, 19, Eastgate, Pickering, Red Malay.
 723 R. N.—MAJOR J. A. MORRISON, D.S.O., Basildon Park, Reading, White Plymouth Rock.
 H. C.—730. C.—725.

Awards of Poultry Prizes at Newcastle-on-Tyne, 1923. cxxxvii

Class 503.—Hens or Pullets, any other distinct variety, except Bantams.

- 741 I.—HARRY FOX, Richmond Poultry Farm, Matlock, Derby.
 742 II.—MAJOR J. A. MORRISON, D.S.O., Reddon Park, Brading, White Plymouth Rock.
 743 III.—THOMAS ABBOT, Forncett, Norfolk, Andalusian.
 744 R. N.—HENRY HUNT, Clifolds Mesne, Newent, Jubilee.
 H. C.—742. C.—752.

Class 504.—Utility Poultry. White Wyandotte Cocks or Cuckles.

- 751 I. & 756 R. N.—RICHARD RODWELL, Walverton Poultry Farm, Nelson.
 752 II.—W. RUNCIMAS, Poultry Farm, Lafford, Devon.
 753 III.—JAMES HUNTLEY AND SON, Hirscl Poultry Farm, Coldstream.
 H. C.—753, 755. C.—755, 757.

Class 505.—Utility Poultry. White Wyandotte Hens or Pullets.

- 758 I.—RICHARD RODWELL, Walverton Poultry Farm, Nelson.
 759 II.—LADY ANDERSON, Hatfield Park, Sharnbrook.
 760 III.—J. J. ROBINSON, Dungalow Poultry Farm, Gainford-on-Tees.
 761 R. N.—LT. COL. G. M. TYRKELL, Bletsoe, Bedford.
 H. C.—774, 780. C.—774, 785.

Class 506.—Utility Poultry. White Leghorn Cocks or Cuckles.

- 762 I.—JAMES HUNTLEY AND SON, Hirscl Poultry Farm, Coldstream.
 763 II.—DAVID C. GAULDER, 45, Disband Street, Arleoth.
 764 III.—OUSE MANOR FARMS, Sharnbrook.
 C.—795.

Class 507.—Utility Poultry. White Leghorn Hens or Pullets.

- 769 I.—RALPH DAWSON, Emmett Carr Farm, Roushew, Chesterfield.
 806 II.—ROBERT ARMSTRONG, South Broomford, Chathill.
 810 III.—JAMES HUNTLEY AND SON, Hirscl Poultry Farm, Coldstream.
 805 R. N.—MRS. BRAMWELL DAVIS, Loinworth Poultry Farm, Cambs.
 H. C.—805. C.—801, 808.

Class 508.—Utility Poultry. Rhode Island Red Cocks or Cuckles.

- 814 I.—MISS A. G. NELSON, Timber House, Cliffe Park, Sunderland.
 812 II.—SIR JAMES KNOTT, BT., Chase House Home Farm, Wylam-on-Tyne.
 822 III.—H. HAROLD LLOYD, Olney Poultry Farm, Sandbach.
 811 R. N.—H.R.H. THE PRINCE OF WALES, K.G., Landulph, Hatt, Cornwall.
 H. C.—817, 825. C.—816, 821.

Class 509.—Utility Poultry. Rhode Island Red Hens or Pullets.

- 820 I.—C. N. GOODE, The Haydens, Bletsoe, Bedford.
 833 II.—HENRY WILLIAMS, Walker Road, St. Anthony, Newcastle-on-Tyne.
 847 III.—W. AND J. LYNN, 63, Park Road, Blackhill.
 843 R. N.—OUSE MANOR FARMS, Sharnbrook.
 H. C.—819. C.—824, 839, 848.

Class 510.—Utility Poultry. Sussex Cocks or Cuckles, any colour.

- 845 I.—LADY ANDERSON, Hatfield Park, Sharnbrook.
 857 II.—MISS E. POTTS, Bullock Steads Farm, Keinton, Newcastle-on-Tyne.
 856 III.—E. HEFFLER AND SONS, Holburn Poultry Farm, Ryton-on-Tyne.
 855 R. N.—SIR JAMES KNOTT, BT., Chase House Home Farm, Wylam-on-Tyne.
 H. C.—852.

Class 511.—Utility Poultry. Sussex Hens or Pullets, any colour.

- 870 I.—MISS A. G. NELSON, Timber House, Cliffe Park, Sunderland.
 868 II.—CHASE HOUSE POULTRY FARM, HIRSTON, SURREY.
 863 III.—LADY ANDERSON, Hatfield Park, Sharnbrook.
 865 R. N.—JAMES HUNTLEY AND SON, Hirscl Poultry Farm, Coldstream.
 H. C.—866, 867. C.—864, 871.

Class 512.—Utility Poultry. Hens or Pullets, any variety, not sitting.

- 881 I.—A. DUDLEY THOMPSON, The Hollow Tree, Tardleigh, Brompton, Brown Leg horn.
 872 II.—H.R.H. THE PRINCE OF WALES, K.G., Landulph, Hatt, Cornwall, Minorca.
 883 III.—MAJOR T. POTTER, 88, Stephens, St. Albans, Black Leghorn.
 882 R. N.—JAMES HUNTLEY AND SON, Hirscl Poultry Farm, Coldstream, Black Minorca.
 H. C.—880, 886. C.—875, 876.

Class 513.—Aylesbury Ducks.

- 890 I. & 887 II.—JAMES HUNTLEY AND SON, Hirscl Poultry Farm, Coldstream.
 885 III. & 891 R. N.—MRS. M. E. COOKE, The Grange Poultry Farm, Tynbury.

cxxxxviii *Awards of Poultry Prizes at Newcastle-on-Tyne, 1923.*

Class 514.—Aylesbury Ducks.

- 892 I. & 894 II.—JAMES HUNTLY AND SON, Hirsel Poultry Farm, Coldstream.
893 III. & 896 R. N.—MRS. M. E. COOKE, The Grange Poultry Farm, Tenbury.

Class 515.—Rouen Drakes.

- 900 I.—JAMES HUNTLY AND SON, Hirsel Poultry Farm, Coldstream.
898 II.—MRS. M. E. COOKE, The Grange Poultry Farm, Tenbury.
897 III.—ARTHUR E. BREWIN, Llysmeirchion, Trefnant.
899 R. N.—CAPT. J. R. RENWICK, Auburn Hill, Malton.

Class 516.—Rouen Ducks.

- 904 I.—ARTHUR E. BREWIN, Llysmeirchion, Trefnant.
903 II.—MRS. M. E. COOKE, The Grange Poultry Farm, Tenbury.
905 III.—JAMES HUNTLY AND SON, Hirsel Poultry Farm, Coldstream.
901. R. N.—MISS BETTY WILKINSON, Barneystead, Wark-on-Tyne.

Class 517.—Fawn Indian Runner Drakes or Ducks, bred prior to 1923.

- 917 I. & R. N. for Special.—THE REV. JOHN WILSON, The Rectory, Hutton-in-the-Forest, Penrith.
914 II.—W. ERIC THOMAS, Tandderwen, Henrhyd, Conway.
915 III & Special.—E. H. LANG, Craig Biliern, Dalbeattie.
919 R. N.—T. LEO PAISLEY, Calder Hall, Calder Bridge.
H. C.—924. C.—907.

Class 518.—Fawn Indian Runner Drakes or Ducks, bred in 1923.

- 935 I.—E. H. LANG, Craig Bittern, Dalbeattie.
917 I. & R. N. for Special, & 934 R. N.—THE REV. JOHN WILSON, The Rectory, Hutton-in-the-Forest, Penrith.
936 III.—O. HADDON JONES, Longfield, Tenbury.
H. C.—932. C.—920.

Class 519.—Indian Runner Drakes or Ducks, any other colour, bred prior to 1923.

- 935 I. & Special.—MRS. M. E. COOKE, The Grange Poultry Farm, Tenbury.
942 II, 953 III. & 950 R. N.—THE REV. JOHN WILSON, The Rectory, Hutton-in-the-Forest, Penrith.
H. C.—938, 944. C.—937, 958.

Class 520.—Indian Runner Drakes or Ducks, any other colour, bred in 1923.

- 967 I.—REGINALD APPELYARD, Brewsters, Ixworth, Bury St. Edmunds.
971 II. & 962 R. N.—THE REV. JOHN WILSON, The Rectory, Hutton-in-the-Forest, Penrith.
970 III.—MRS. ALLAN J. MOORE, Eight Oaks, Knutsford.
H. C.—963. C.—961.

Class 521.—Buff Orpington Drakes or Ducks, bred prior to 1923.

- 975 I. & R. N. for Special, & 983 III.—JAMES HUNTLY AND SON, Hirsel Poultry Farm, Coldstream.
932 II.—MISS ESMÉ GILROY, Dulcote, Bridgnorth.
981 R. N.—W. H. MITCHELL, Elmdene, Kenilworth.
H. C.—984. G.—972.

Class 522.—Buff Orpington Drakes or Ducks, bred in 1923.

- 967 I. & Special, & 980 III.—JAMES HUNTLY AND SON, Hirsel Poultry Farm, Coldstream.
966 II.—WILLIAM G. KINGWELL, Dartmoor Poultry Farm, South Brent.
901 R. N.—W. H. MITCHELL, Elmdene, Kenilworth.
H. C.—1000, 1001. C.—994.

Class 523.—Drakes, any other variety.

- 1008 I.—WILLIAM G. KINGWELL, Dartmoor Poultry Farm, South Brent.
1007 II.—R. P. PERCHVAL, Shuttington House, Tamworth, Magpie.
1005 III.—WILLIAM RICHARDSON, 13, Bootham Crescent, York. Cayuga.
1003 R. N.—JAMES NAGLE, Stonehenge Pedigree Stock Farm, Amesbury. Blue Orpington.
H. C.—1004.

Class 524.—Ducks, any other variety.

- 1010 I.—WILLIAM G. KINGWELL, Dartmoor Poultry Farm, South Brent.
1011 II.—WILLIAM RICHARDSON, 13, Bootham Crescent, York. Cayuga.
1012 III.—JAMES NAGLE, Stonehenge Pedigree Stock Farm, Amesbury. Blue Orpington.
1009 R. N.—MISS JOHLIFFE, Hemingford Park, Huntingdon. Magpie.

Awards of Poultry Prizes at Newcastle-on-Tyne, 1923. cxxxix

Class 525.—Emden Ganders or Geese.

- 1015 I.—ABBOT BROS., Thuxton, Norfolk.
 1016 II. & 1019 III.—THOMAS ABBOT, Forncett, Norfolk.
 1014 R. N.—REGINALD APPELBY, Brewsters, Ixworth, Bury St. Edmunds.
 H. C.—1018.

Class 526.—Toulouse Ganders or Geese.

- 1020 I.—ABBOT BROS., Thuxton, Norfolk.
 1022 II.—THOMAS ABBOT, Forncett, Norfolk.

Class 527.—American Bronze Turkey Cocks.

- 1027 I.—THOMAS ABBOT, Forncett, Norfolk.
 1026 II.—ABBOT BROS., Thuxton, Norfolk.
 1020 III.—THE EARL OF ELGIN, C.M.G., Broomhall, Dunfermline.
 1024 R. N.—JAMES NAGLE, Stonehenge Pedigree Stock Farm, Amesbury.
 H. C.—1029. C.—1028.

Class 528.—American Bronze Turkey Hens.

- 1034 I.—ABBOT BROS., Thuxton, Norfolk.
 1035 II. & 1031 R. N.—JAMES NAGLE, Stonehenge Pedigree Stock Farm, Amesbury.
 1030 III.—THE EARL OF ELGIN, C.M.G., Broomhall, Dunfermline.
 H. C.—1032, 1036. C.—1033.

Class 529.—Turkey Cocks, any other variety.

- 1040 I.—JAMES NAGLE, Stonehenge Pedigree Stock Farm, Amesbury. Austrian White.

Class 530.—Turkey Hens, any other variety.

- 1041 I. & 1042 II.—JAMES NAGLE, Stonehenge Pedigree Stock Farm, Amesbury. Austrian White.

Class 531.—Sebright Bantam Cocks or Cockrels.

- 1047 I.—J. C. PRESTON, Bay Horse, Ebbel, Lancaster.
 1046 II.—A. R. FISH, Holme Mead, Hutton, Preston.
 1043 III.—C. I. YOUNG, 8, Palmer Street, Frome.
 1044 R. N.—T. H. EGLESTONE, St. John's Chapel, Weardale.
 H. C.—1045.

Class 532.—Sebright Bantam Hens or Pullets.

- 1051 I.—J. C. PRESTON, Bay Horse, Ebbel, Lancaster.
 1040 II.—A. R. FISH, Holme Mead, Hutton, Preston.
 1043 III.—T. H. EGLESTONE, St. John's Chapel, Weardale.
 1052 R. N.—KRAY AND SONS, 12, Lower Keyford, Frome.
 H. C.—1050.

Class 533.—Wyandotte Bantam Cocks or Cockrels.

- 1054 I.—J. F. ENTWISLE, Crigglesstone Manor Farm, Wakefield.
 1058 II.—CATER AND BOOTH, Seabrooks, Alfreton.
 1056 III.—ROBERT BENNETT, The Butts, Frome.
 1057 R. N.—ISAAC MURFIN, Nuttall Park, Ripley, Derby.
 H. C.—1055.

Class 534.—Wyandotte Bantam Hens or Pullets.

- 1060 I.—J. F. ENTWISLE, Crigglesstone Manor Farm, Wakefield.
 1067 II.—G. T. MURFER, 75, York Street, Mansfield Woodhouse, Notts.
 1066 III.—ISAAC MURFIN, Nuttall Park, Ripley, Derby.
 1061 R. N.—HENRY HUNT, Chiffords Meuse, Newent.
 H. C.—1059, 1065.

Class 535.—Scotch Grey Bantam Cocks or Cockrels.

- 1058 I. & 1071 II.—JAMES MCCRAE, 13, Thomson Street, Kilmarnock.
 1069 III.—JOHN D. JOHNSTON, Norwood, Albert Avenue, Sedgeley Park, Prestwich.
 1070 R. N.—R. FLETCHER HEARNshaw, Fox Hill, Burton Joyce, Nottingham.

Class 536.—Scotch Grey Bantam Hens or Pullets.

- 1078 I. & 1073 III.—JAMES MCCRAE, 13, Thomson Street, Kilmarnock.
 1074 II.—JAMES S. HEBBURN, Buckland, Berks.
 1075 R. N.—R. FLETCHER HEARNshaw, Fox Hill, Burton Joyce, Nottingham.
 H. C.—1072.

cxl *Awards of Poultry Prizes at Newcastle-on-Tyne, 1923.*

Class 537.—Frizzle Bantam Cocks or Cockerels.

- 1079 I. & 1082 II.—J. P. ENTWISLE, Crigglestone Manor Farm, Wakefield.
 1080 III.—A. HOBSON, Edge Hill, Penistone.
 1077 R. N.—MAJOR G. T. WILLIAMS, Tredrea, Ferranwell.
 H. C.—1081.

Class 538.—Frizzle Bantam Hens or Pullets.

- 1086 I. & 1091 II.—J. P. ENTWISLE, Crigglestone Manor Farm, Wakefield.
 1090 III.—SIR CLAUD ALEXANDER, Bt., Faygate Wood, Faygate, Sussex.
 1088 R. N.—A. HOBSON, Edge Hill, Penistone.
 H. C.—1085, 1089.

Class 539.—Old English Game Bantam Cocks or Cockerels.

- 1099 I. & 1095 II.—R. S. MARSDEN, Bridge House, Chatburn, Clitheroe.
 1104 III.—SIDNEY NEWTON, 10, Mansfield Road, Mansfield Woodhouse, Notts.
 1101 R. N.—CAPT. F. GILES BATES, The Spital, Hexham.
 H. C.—1094, 1096, 1097.

Class 540.—Old English Game Bantam Hens or Pullets.

- 1107 I. & 1114 R. N.—R. S. MARSDEN, Bridge House, Chatburn, Clitheroe.
 1105 II.—R. FLETCHER HEARNshaw, Fox Hill, Burton Joyce, Nottingham.
 1108 III.—MISS C. E. DAVIES, Mapleton, Edenbridge.
 H. C.—1111, 1116.

Class 541.—Indian Game Bantam Cocks or Cockerels.

- 1119 I.—MISS K. FELLY, Theydon Place, Epping.

Class 542.—Indian Game Bantam Hens or Pullets.

- 1121 I.—MRS. M. E. MANSALL, The Shepherd's Close, Kingston Surt, Thame.
 1120 II.—JOSEPH W. ELLWOOD, Papcastle, Cockerneith.
 1123 III. & 1122 R. N.—MISS K. FELLY, Theydon Place, Epping.

Class 543.—Modern Game Bantam Cocks or Cockerels, any colour.

- 1124 I.—LORD DEWAR, Homestall Poultry Farm, East Grinstead.
 1125 II.—R. FLETCHER HEARNshaw, Fox Hill, Burton Joyce, Nottingham.
 1126 III.—R. S. MARSDEN, Bridge House, Chatburn, Clitheroe.

Class 544.—Modern Game Bantam Hens or Pullets, any colour.

- 1128 I.—R. S. MARSDEN, Bridge House, Chatburn, Clitheroe.
 1127 II.—H. ELTRINGHAM, 119, Durlish Road, Blackhill.
 1129 III.—R. FLETCHER HEARNshaw, Fox Hill, Burton Joyce, Nottingham.

Class 545.—Black or White Rosecomb Bantam Cocks or Cockerels.

- 1131 I.—A. R. FISH, Holme Mead, Hutton, Preston.
 1132 II.—R. FLETCHER HEARNshaw, Fox Hill, Burton Joyce, Nottingham.
 1130 III.—LADY ARMSTRONG, Craigside, Rothbury.

Class 546.—Black or White Rosecomb Bantam Hens or Pullets.

- 1134 I.—A. R. FISH, Holme Mead, Hutton, Preston.
 1136 II.—T. A. STOCKINGS, 17, Salisbury Road, Norwich.
 1138 III. & 1135 R. N.—MRS. H. L. DE LEH, Shindcliffe House, Shindcliffe.
 H. C.—1137.

Class 547.—Barbu d'Anver Cocks or Cockerels.

- 1142 I.—W. GRINDLEY, Green Lane, Clifton, Ashbourne.
 1139 II. & 1145 III.—KENNETH WARD, Tweed Villa, Haxby, York.
 1140 R. N.—R. FLETCHER HEARNshaw, Fox Hill, Burton Joyce, Nottingham.
 H. C.—1141, 1143.

Class 548.—Barbu d'Anver Hens or Pullets.

- 1147 I.—RICHARD TIEROT, Burchett's Green, Maidenhead.
 1148 II.—DR. J. W. STONE, Harwood, Maidenhead.
 1149 III.—KENNETH WARD, Tweed Villa, Haxby, York.
 1151 R. N.—CAPT. W. L. RENWICK, 3, Wellington Road, Newark.
 H. C.—1150.

Class 549.—Cochin or Pekin Bantam Cocks or Cockerels.

- 1153 I.—GEORGE H. PROCTER, Flass House, Durham.
 1154 II.—R. RICHARDSON, 108, Gala Park Road, Galashiels.
 1155 III.—W. CORLEY YEAMAN, Warden Cottage, Longbenton, Newcastle-on-Tyne.

Awards of Rabbit Prizes at Newcastle-on-Tyne, 1923. cxli

Class 550.—Cochin or Pekin Bantam Hens or Pullets.

- 1156 I.—LORD DEWAR, Homestall Poultry Farm, East Grinstead.
 1157 II.—J. F. ENTWISLE, Crigglestone Manor Farm, Wakefield.
 1158 III.—JOHN BURDETT, Lake Bank Terrace, Wingate.
 1159 R. N.—GEORGE H. PROCTER, Flass House, Durham.
 H. C.—1160.

Class 551.—Japanese Bantam Cocks or Cockerels.

- 1164 I.—MATTHEW BELL, Agra House, Haxby, York.
 1165 II.—MAJOR G. T. WILLIAMS, Tredrea, Perranwell.
 1166 III. & 1166 R. N.—ALFRED E. W. DARBY, Adeote, Shrewsbury.
 H. C.—1165.

Class 552.—Japanese Bantam Hens or Pullets.

- 1167 I. & 1170 III.—MAJOR G. T. WILLIAMS, Tredrea, Perranwell.
 1169 II.—MATTHEW BELL, Agra House, Haxby, York.
 1171 R. N.—ALFRED E. W. DARBY, Adeote, Shrewsbury.

Class 553.—Bantam Cocks or Cockerels, any other variety.

- 1175 I.—J. F. ENTWISLE, Crigglestone Manor Farm, Wakefield. Plymouth Rock.
 1172 II.—T. E. CLARKE, Chalfan Hall, Silverdale, Lancs. Gold Spangled Hamburg.
 1174 III.—TOM H. FURNESS, Carlton House, Chesterfield. Rhode Island Red.
 1176 R. N.—HENRY HUNT, Clifolds Messie, Newent. Jubilee.
 H. C.—1173.

Class 554.—Bantam Hens or Pullets, any other variety.

- 1185 I.—J. F. ENTWISLE, Crigglestone Manor Farm, Wakefield. Plymouth Rock.
 1179 II.—W. H. CLARKSON, Carr Gate, Wakefield. White Polish.
 1188 III.—W. COPLEY YEAMAN, Warden Cottage, Longbenton, Newcastle-on-Tyne. Brahma.
 1178 R. N.—LADY RACHEL BYNG, High Sandhoe, Hexham. Silkie.

RABBITS.

Special Prizes were given in the Rabbit Classes by the following Clubs:—National Flemish, Giant Rabbit, National English Rabbit, United Kingdom Dutch Rabbit, Universal Angora Rabbit, Tan Rabbit, and National Polish Rabbit.

Class 555.—Belgian Hare Adult Bucks.

- 1 I. (20s.)—EDWARD OLIVEAND, Third House Farm, Ashington.
 2 II. (15s.)—F. W. PAIGE, Rostrevor, Histon, Cambs.
 2 R. N.—JOSEPH GRAHAM, 19, Hartington Street, Gateshead.

Class 556.—Belgian Hare Adult Does.

- 4 I. (20s. & R. N. for Champion).—F. W. PAIGE, Rostrevor, Histon, Cambs.
 5 II. (15s.)—THOMAS S. WARD, 21, South Parade, Spalding.

Class 557.—Belgian Hare Bucks, under 6 months.

- 6 III. (10s.)—DOGGETT AND ANDREWS, School Hill, Histon, Cambs.

Class 558.—Belgian Hare Bucks, under 4 months.

- 10 I. (20s.)—WOODFORD AND SOX, 6, Broad Street, Ely.

Class 560.—Belgian Hare Does, under 4 months.

- 12 I. (20s. & Champion).—G. W. FOREMAN, 14, Marks Street, West Hartlepool.
 11 II. (15s.)—WOODFORD AND SOX, 6, Broad Street, Ely.
 13 III. (10s.)—MACHELL AND WILSON, High Hope Street, Crook.
 14 R. N.—G. FRANKLAND, 12, Pilgrim Street, Monkwearmouth, Sunderland.

Class 561.—Flemish Giant Adult Bucks.

- 18 I. (20s. & R. N. for Special), & 20 II. (15s.)—C. WREX, 30, Church Grove, Hampton Wick.
 17 III. (10s.)—T. W. SMITH, 152, Acre Lane, Brixton, London, S.W.
 19 IV. (5s.)—ROBERT G. CHARLTON, 15, George Road, Wallsend-on-Tyne.

¹ The Newberry Challenge Trophy given by the National Belgian Hare Club for the best Belgian Hare.

cxlii *Awards of Rabbit Prizes at Newcastle-on-Tyne, 1923.*

Class 562.—Flemish Giant Adult Does.

- 25 I. (20s. & Special).—C. WREN, 30, Church Grove, Hampton Wick.
23 II. (15s.).—JOSEPH GRAHAM, 19, Hartington Street, Gateshead.

Class 563.—Flemish Giant Bucks or Does, under 6 months.

- 31 I. (20s. & Special).—T. W. SMITH, 152, Acre Lane, Brixton, London, S.W.
32 II. (15s.), & 34 III. (10s.).—C. WREN, 30, Church Grove, Hampton Wick.
30 IV. (5s.).—JOSEPH GRAHAM, 19, Hartington Street, Gateshead.

Class 564.—Flemish Giant Bucks or Does, under 4 months.

- 37 I. (20s. & R. N. for Special).—T. W. SMITH, 152, Acre Lane, Brixton, S.W.
39 II. (15s.).—C. WREN, 30, Church Grove, Hampton Wick.
40 III. (10s.).—H. RUSSELL, 12, Holly Burton Road, Hove.
42 IV. (5s.).—H. E. WILK, 32, Thanet Road, Erith.
35 R. N.—FREDERICK GREVETT, The Pines, Slindon Common, Arundel.
H. C.—44. C.—43.

Class 565.—English Black or Blue Adult Bucks or Does.

- 45 I. (20s. & Special).—J. JOHNSON, Shadforth, Durham.
50 II. (15s. & R. N. for Special).—J. W. HANDFORD, Thornton Villa, Barcroft Road, Close Hill, Huddersfield.
47 III. (10s.).—F. W. BOYD AND SON, 26, Church Street, Dunston-on-Tyne.
49 R. N.—JOHNSON AND BELLAMY, 221, Freeman Street, Grimsby.
H. C.—46, 51. C.—49.

Class 566.—English Adult Bucks or Does, any other colour.

- 53 I. (20s.).—ATKINSON AND NOEL, 63, Station Road, Helton-le-Hole.
57 II. (15s.).—JOHNSON AND BELLAMY, 221, Freeman Street, Grimsby.
55 III. (10s.).—HARRISON BROS., Victoria House, Wreckington, Gateshead.
56 R. N.—JAMES EAGLEE, 14, Ely Street, Gateshead.
H. C.—54.

Class 567.—English Black or Blue Bucks or Does, under 5 months.

- 62 I. (20s. & Special).—J. G. SWALE, 14, Brown's Buildings, Chester-le-Street.
60 II. (15s. & R. N. for Special).—MISS ENID MYNORS, Station Street, Ashbourne.
61 III. (10s.).—JOHNSON AND BELLAMY, 221, Freeman Street, Grimsby.
59 R. N.—F. W. BOYD AND SON, 26, Church Street, Dunston-on-Tyne.
H. C.—58.

Class 568.—English Bucks or Does, any other colour, under 5 months.

- 64 I. (20s.).—H. FURNISH, 6, Upper Russell Street, Darlington.
66 III. (10s.).—JAMES BAILEY, 14, Ely Street, Gateshead.
H. C.—55. C.—67.

Class 569.—Dutch Black or Blue Adult Bucks or Does.

- 74 I. (20s. & Special).—E. S. HANBURY, King Street, Duffield, Derby.
75 II. (15s. & R. N. for Special).—FRANK RECORD, 72, Barlow Street, Derby.
70 III. (12s. 6d.).—MRS. E. AYERRELL, Low Leazes, Hexham.
76 IV. (7s. 6d.).—F. P. SUTTON, Bondgate, Castle Donington, Derby.
C.—76.

Class 570.—Dutch Adult Bucks or Does, any other colour.

- 81 I. (20s.).—A. V. LOW, 8, South Church Road, Bishop Auckland.
79 II. (15s.).—EADY BROS., Burbage, Hinckley.
84 III. (12s. 6d.).—GEORGE FOORD, Colliery Inn, Thornley, Co. Durham.
80 IV. (7s. 6d.).—S. HEATLEY, 11, Highwood View, Durham.
H. C.—82, 83.

Class 571.—Dutch Black or Blue Bucks or Does, under 4 months.

- 101 I. (20s.).—HERBERT PHILLIPS, Bank House, Long Buckby, Rugby.
95 II. (15s.).—J. A. REAY, 14, Jockey Street, Sherburn Hill.
100 III. (12s. 6d.).—F. BRONSON, Cold Brayfield, Turvey, Beds.
93 IV. (7s. 6d.).—E. E. LLOYD, 12, Larkspur Terrace, Jesmond, Newcastle-on-Tyne.
H. C.—87, 89. C.—96.

Class 572.—Dutch Bucks or Does, any other colour, under 4 months.

- 102 I. (20s.).—T. K. HOOD, 1, Elliott Road, Old Ford, Gateshead.
108 II. (15s.).—JAMES CHARLTON, 10, Canada Street, Shieldfield, Newcastle-on-Tyne.
103 III. (12s. 6d.).—EADY BROS., Burbage, Hinckley.
105 IV. (7s. 6d.).—J. W. HANDFORD, Thornton Villa, Barcroft Road, Close Hill, Huddersfield.
H. C.—104, 106. C.—108.

¹ Fourth Prize given by the National Flemish Giant Rabbit Club.

² 2s. 6d. towards each Third Prize, and the whole of each Fourth Prize were given by the United Kingdom Dutch Rabbit Club.

Awards of Rabbit Prizes at Newcastle-on-Tyne, 1923. exliii

Class 573.—Angora White Adult Bucks or Does.

- 112 I. (20s. & Special).—THOMAS A. FORSTER, Angora House, Mount View West, Ryton-on-Tyne.
 115 III. (10s.)—MISS F. NICHOL, 70, Rawling Road, Gateshead.

Class 574.—Angora White Bucks or Does, under 4 months.

- 120 I. (20s. & R. N. for Special).—J. W. DALE, 15, Bright Street, West Hartlepool.
 128 II. (15s.)—J. W. HUTCHINSON, 117, Stone Street, Newcastle-on-Tyne.
 117 III. (10s.)—THOMAS A. FORSTER, Angora House, Mount View West, Ryton-on-Tyne.
 118 R. N.—ARTHUR WRIGHT, Ullesthorpe, Rugby.
 H. C.—124, 126. C.—125.

Class 576.—Angora Bucks or Does, any other colour, under 4 months.

- 132 I. (20s. & Special).—T. THACKER AND SON, 24, Waller Street, Leamington Spa.

Class 577.—Blue Beveren Bucks, bred in 1923.

- 143 I. (20s.)—S. WEBBER, 38, Brighton Road, Redland, Bristol.
 142 II. (15s.)—MRS. S. M. TOMLINSON, Clayton Poultry Farm, Newcastle, Staffs.
 134 III. (10s.)—S. KIRBY, Oakley, Fairwater Grove, Llandaff, Cardiff.
 149 IV. (6s.)—JOHN DREUMOND, Megginch Castle, Errol.
 144 V. (4s.)—ERNEST READ, 25, Salvine Terrace, Fishburn, Ferryhill.
 151 R. N.—G. WALKER, 44, Trinity Street, Gainsborough.
 H. C.—135. C.—146.

Class 578.—Blue Beveren Does, bred in 1923.

- 163 I. (20s.), 155 III. (10s.), & 159 V. (4s.)—MRS. S. M. TOMLINSON, Clayton Poultry Farm, Newcastle, Staffs.
 158 II. (15s.)—PERCY K. PICKERING, Townhead, Alton.
 154 IV. (6s.)—S. KIRBY, Oakley, Fairwater Grove, Llandaff, Cardiff.
 170 R. N.—MR. AND MRS. C. W. JUDE, 5, Fisher Street, Cambridge.
 H. C.—150. C.—166.

Class 579.—White Beveren Bucks or Does, bred in 1923.

- 172 I. (20s.), & 175 III. (10s.)—G. H. BEASLEY, Broom Close, Filmore, York.
 174 II. (15s.)—MRS. AND MISS LONG, The Hawthorns, Claydon, Ipswich.

Class 580.—Havana Bucks, bred in 1923.

- 180 I. (20s.)—HENRY F. BLAAUW, Townings Place, Wivelsfield, Haywards Heath.
 182 II. (15s.)—HANSON AND HARTLEY, 35, Station Road, Rishon, Lancs.
 187 III. (10s.)—JOHN DREUMOND, Megginch Castle, Errol.
 185 IV. (6s.), & 181 V. (4s.)—MRS. S. M. TOMLINSON, Clayton Poultry Farm, Newcastle, Staffs.
 179 R. N.—R. P. ROWELL, 78, Wingrove Road, Newcastle-on-Tyne.

Class 581.—Havana Does, bred in 1923.

- 193 I. (20s.)—HANSON AND HARTLEY, 35, Station Road, Rishon, Lancs.
 189 II. (15s.)—E. C. RICHARDSON, Ecclesbourne, West Byfleet.
 196 III. (10s.), & 192 V. (4s.)—MRS. S. M. TOMLINSON, Clayton Poultry Farm, Newcastle, Staffs.
 191 IV. (6s.)—R. P. ROWELL, 78, Wingrove Road, Newcastle-on-Tyne.
 174 R. N.—WILLIAM WALLER, 141, Eltchin Road, Luton.

Class 582.—Chinchilla Bucks, bred in 1923.

- 202 I. (20s.)—ARTHUR WRIGHT, Ullesthorpe, Rugby.
 209 II. (15s.)—LADY VICTORIA PERCY, Tynewood, Ovingham-on-Tyne.
 206 III. (10s.)—CAPT. W. ERMOWELL, The White House, Campsea Ash, Wickham Market.
 206 IV. (6s.)—THE HON. MRS. E. LASCELLES, Linton Spring, Wetherby.
 205 V. (4s.)—C. J. DAVIES, Culverlands, Lindfield, Haywards Heath.
 210 R. N.—MISS BEATRICE S. WALLER, Hungarian Hall, Pettistree, Wickham Market.
 H. C.—203. C.—204.

Class 583.—Chinchilla Does, bred in 1923.

- 203 I. (20s.)—LADY VICTORIA PERCY, Tynewood, Ovingham-on-Tyne.
 220 II. (15s.)—R. NELSON, 7, Golden Hill Lane, Leyland, Preston.
 215 III. (10s.)—ARTHUR WRIGHT, Ullesthorpe, Rugby.
 217 IV. (6s.)—HENRY T. BLAAUW, Townings Place, Wivelsfield, Haywards Heath.
 219 V. (4s.)—CAPT. W. ERMOWELL, The White House, Campsea Ash, Wickham Market.
 224 R. N.—JOHN DREUMOND, Megginch Castle, Errol.
 H. C.—213. C.—226.

¹ The Fourth and Fifth Prizes in these Classes were given by the Beveren Club.

cxliv *Awards of Rabbit Prizes at Newcastle-on-Tyne, 1923.*

Class 584.—*Argente de Champagne Bucks or Does, bred in 1923.*

- 229 I. (20s.). & 231 II. (15s.)—MITCHELL AND BALMER, Birches Brow, Aughton, Ormskirk.
 228 III. (10s.), & 230 IV. (8s.)—MR. AND MRS. B. DE H. PICKARD, Elmhurst Lodge,
 Nelson, Morebary.
 232 V. (4s.)—THE HON. MRS. E. LASCELLES, Linton Spring, Wetherby.

Class 585.—*Lilac Bucks or Does, bred in 1923.*

- 235 I. (20s.)—L. HUGH, 7, Dierdon's Terrace, Middleswich.
 236 II. (15s.)—HANSON AND HARTLEY, 35, Station Road, Rishton, Lancs.
 239 III. (10s.), & 234 V. (4s.)—CHARLES L. SMITH, 25, Monk's Road, Winchester.
 238 IV. (6s.), & 233 R. N.—THOMAS S. LEA, Cooimassic, Uppingham Road, Ldcester.
 H. C.—237.

Class 587.—*Silver Grey Adult Bucks or Does.*

- 240 I. (20s.), & 244 IV. (6s.)—COOK AND OUGHTRED, Springfield, West Hartlepool.
 247 II. (15s.)—W. FORSTER, 13, St. Helen's Terrace, East Hetton, Coxhoe, Co. Durham.
 250 III. (10s.)—PALMER AND SON, Cambridge Road, Sandy.
 245 R. N.—A. G. GREEN, 40, Heath Road, Wadsley Bridge, Sheffield.
 H. C.—243. C.—248.

Class 588.—*Silver Grey Bucks or Does, under 5 months.*

- 255 I. (20s.)—THOMPSON BROS., Hotel Victoria, Witton-le-Wear.
 256 II. (15s.)—COOK AND OUGHTRED, Springfield, West Hartlepool.
 257 III. (10s.)—SLATER AND SON, 42, Lyons Colliery, Hetton-le-Hole.
 258 IV. (5s.)—SAYER AND BULMAN, 26, Clarence Terrace, Willington, Co. Durham.
 252 R. N.—W. WEATHERILL, 24, Grace Street, West Hartlepool.
 H. C.—254. C.—253.

Class 589.—*Silver Fawn Adult Bucks or Does.*

- 259 I. (20s.)—E. W. EASTON, 35, Caldecott Street, Rugby.
 260 II. (15s.)—J. W. BROWN, 8, Graham Terrace, New Shildon.
 263 III. (10s.)—W. FORSTER, St. Helen's Terrace, East Hetton, Coxhoe, Co. Durham.
 264 IV. (5s.)—PALMER AND SON, Cambridge Road, Sandy.
 261 R. N.—JOHN E. PEARSON, 6, The Green, Bishop Wearmouth, Sunderland.

Class 590.—*Silver Fawn Bucks or Does, under 5 months.*

- 265 I. (20s.)—E. W. EASTON, 35, Caldecott Street, Rugby.
 266 II. (15s.)—J. W. BROWN, 8, Graham Terrace, New Shildon.
 267 III. (10s.)—PALMER AND SON, Cambridge Road, Sandy.

Class 591.—*Silver Brown Adult Bucks or Does.*

- 268 I. (20s.)—THOMPSON BROS., Hotel Victoria, Witton-le-Wear.

Class 592.—*Silver Brown Bucks or Does, under 5 months.*

- 269 I. (20s.), & 271 II. (15s.)—THOMPSON BROS., Hotel Victoria, Witton-le-Wear.
 270 III. (10s.)—PALMER AND SON, Cambridge Road, Sandy.

Class 594.—*Tan Adult Bucks or Does.*

- 274 I. (20s. & Special.)—THOMAS APPLEBY, 11, Wilfred Street, Chester-le-Street.
 272 II. (15s.)—SAMUEL ALLWOOD, 96, Crowe Street, Derby.
 275 III. (10s.)—W. J. CHILDS, 290, Mill Road, Romsey Town, Cambridge.
 273 R. N.—ARTHUR PICKLES, 18, Woodlands Road, Gillington, Bradford.

Class 595.—*Tan Bucks or Does, under 5 months.*

- 276 I. (20s.)—SAMUEL ALLWOOD, 96, Crowe Street, Derby.
 279 II. (15s.)—ARTHUR PICKLES, 18, Woodlands Road, Gillington, Bradford.
 277 III. (10s.)—MRS. HILL, 356, Main Road, Darnall, Sheffield.
 280 R. N.—THOMAS APPLEBY, 11, Wilfred Street, Chester-le-Street.
 H. C.—282. C.—281.

Class 596.—*Polish Bucks or Does, under 6 months.*

- 286 I. (20s. & Special.), & 288 III. (10s.)—J. MEYNELL, 48, North Road, Darlington.
 289 II. (15s. & R. N. for Special.)—MISS PARKINSON, 44, Four Lane Ends, Hetton-le-Hole.
 284 IV. (5s.)—E. W. EASTON, 35, Caldecott Street, Rugby.
 290 R. N.—ELLIOTT AND SHAW, 12, Park Terrace, Sunderland.
 H. C.—287. C.—291.

¹ The Fourth and Fifth Prizes in these Classes were given by the Beveren Club.

² The Fourth Prizes were given by the National Silver Rabbit Club.

³ The Fourth Prize was given by the National Polish Rabbit Club.

FARM AND DAIRY PRODUCE OF THE UNITED KINGDOM.

Butter.

Class 597.—*Two Pounds of Fresh Butter, without any salt, made up in plain pounds, from the milk of Channel Island, Devon or South Devon Cattle and their crosses.*

- 10 I. (24).—MRS. L. MATTHEWS, Kilkhampton, Bude.
11 II. (22).—MRS. L. R. MILDON, Mead Down, Rackenford.
2 III. (21).—T. R. HOLTHO, Trengwainton, Penzance.
4 R. N.—MISS LUCIE FORSTER, Glebe Farm, Kirkcubrighton, Newcastle-on-Tyne.
H. C.—3, 13. C.—1.

Class 598.—*Two Pounds of Fresh Butter, without any salt, made up in plain pounds, from the milk of cattle of any breed or cross other than those mentioned in Class 597.*

- 32 I. (24).—MISS S. H. ROBINSON, Red House Farm, Liverton, Loftus-in-Cleveland.
25 (Equal Prize) MISS HALL, Low Farm, Redcar.
27 A. of 30s.) MRS. WILLIAM IRVING, Toppin Castle, Heads Nook, Carlisle.
24 R. N.—MRS. M. HALL, Crake Scarr Farm, Butterknowle.
H. C.—17, 22. C.—21.

Class 599.—*Two Pounds of Fresh Butter, slightly salted, made up in plain pounds from the milk of Channel Island, Devon, or South Devon Cattle and their crosses.*

- 50 I. (24).—MRS. L. R. MILDON, Mead Down, Rackenford.
49 II. (22).—MRS. L. MATTHEWS, Kilkhampton, Bude.
51 III. (21).—THE EARL OF MOUNT EDGECUMBE, Mount Edisbury, Plymouth.
18 R. N.—MISS JEAN MACGILLIVRAY, Gay Bowers Farm, Danbury, Chesham.
H. C.—46, 54. C.—41.

Class 600.—*Two Pounds of Fresh Butter, slightly salted, made up in plain pounds, from the milk of cattle of any breed or cross other than those mentioned in Class 599.*

- 72 I. (24).—MRS. WILLIAM IRVING, Toppin Castle, Heads Nook, Carlisle.
59 II. (22).—MRS. S. BRADLE, Broadless Gate, Newbiggin, Middleton-in-Teesdale.
61 III. (21).—MRS. A. A. BERT, Stoodleigh Barton, Tiverton.
66 R. N.—MRS. H. FISHER, Old Town, Southwaite, Carlisle.
H. C.—76. C.—65.

Class 601.—*Three Pounds of Fresh Butter, slightly salted, made up in pounds in the most attractive marketable designs.*

- 91 I. (24).—MRS. W. E. MIDD, Slade House, Darley, Harnagey.
90 II. (22).—MRS. L. R. MILDON, Mead Down, Rackenford.
80 III. (21).—MRS. L. MATTHEWS, Kilkhampton, Bude.
93 R. N.—MISS ANNIE PITCHARD, The Dairy, Welbeck, Worksop.
H. C.—81, 85. C.—96.

Class 602.—*Three Pounds of Fresh Butter, slightly salted, made up in pounds, and packed in non-returnable boxes for transmission by rail or parcel post.*

- 104 I. (24).—MRS. L. R. MILDON, Mead Down, Rackenford.
105 II. (22).—MRS. W. E. MIDD, Slade House, Darley, Harnagey.
99 III. (21).—MRS. A. A. BERT, Stoodleigh Barton, Tiverton.
100 R. N.—ENGLISH DAIRIES, LTD., Crewekecu.
H. C.—107. C.—106.

Cheese.

Made in 1923.

Class 603.—*Two Cheshire Cheeses (Coloured), not less than 40 lb. each.*

- 124 I. (25).—SAMUEL DUTTON, Oak Farm, Houghton, Tarpoley.
129 II. (23).—FRED HUNTBACH, Moor Hall, Aston, Nantwich.
172 III. (22).—THE WALLEY, Towns Green, Wettonhall, Winsford.
127 R. N.—W. H. HOBSON, Woodley Hall, Nantwich.
H. C.—119, 127, 136, 154, 173. C.—129, 134, 165, 169, 173.

cxlvi *Awards of Prizes for Produce at Newcastle-on-Tyne, 1923.*

Class 604.—Two Cheshire Cheeses (Uncoloured), not less than 40 lb. each.

- 189 I. (25.)—W. H. HOBSON, Woodley Hall, Nantwich.
 203 II. (23.)—PHILIP TURNER, Ivy House, Frith, Wrenbury, Nantwich.
 205 III. (22.)—PETER WALKER, Towns Green, Wettonhall, Winsford.
 240 R. N.—G. E. RICHARDS, Sandford Hall Farm, West Felton, Oswestry.
 H. C.—181, 196, 199, 202, 206. C.—180, 185, 190, 192, 197.

Class 605.—Two Cheddar Cheeses, not less than 50 lb. each.

- 220 I. (25.)—MISS STEVENSON, Knocknail, Stranraer.
 213 II. (23.)—WILLIAM HUNTER, Garthland Mains, Stranraer.
 222 III. (22.)—A. AND W. WYLIE, Mossiel, Mauchline.
 212 R. N.—S. AND J. HUNTER, Castle Sinnness, Glenluce.
 H. C.—210, 216, 219. C.—203, 214, 215, 217.

Class 606.—Two Cheddar Truckles.

- 236 I. (24.)—A. AND W. WYLIE, Mossiel, Mauchline.
 230 II. (22.)—JOHN MCHARG, Barbeth, Loswalt, Stranraer.
 228 III. (21.)—WILLIAM HUNTER, Garthland Mains, Stranraer.
 234 R. N.—JAMES WALLACE, Knockneon, Ervie, Stranraer.
 H. C.—226, 232. C.—223, 224.

Class 607.—Two Stilton Cheeses.

- 243 I. (24.)—LONG CLAWSON DAIRY, LTD., Long Clawson, Melton Mowbray.
 242 II. (22.)—MRS. HENRY KNIGHT, Sewgrave, Loughborough.
 243 III. (21.)—UNITED DAIRIES (WHOLESALE), LTD., Harby, Melton Mowbray.
 240 R. N.—JOHN O'GAUNT CREAMERY CO., LTD., John O'Gaunt, Melton Mowbray.
 H. C.—237, 239, 246, 247, 252. C.—250.

Class 608.—Two Wensleydale Cheeses (Stilton shape).

- 256 I. (24.)—MISS E. J. MUDD, Aldborough Dairy, Boroughbridge.
 257 II. (22.)—ALFRED ROWNTREE, SON AND WRIGHT, The Dairy, Coverham, Middleham.
 258 III. (21.)—WENSLEYDALE PURE MILK SOCIETY, LTD., The Dairy, Northallerton.
 255 R. N.—MISS RACHEL JAMES, Llanccayo, near Usk.

Class 609.—Two Colchester Cheeses, Stilton Shape.

- 262 I. (24.)—ALFRED ROWNTREE, SON AND WRIGHT, The Dairy, Coverham, Middleham.
 263 II. (22.)—WENSLEYDALE PURE MILK SOCIETY, LTD., The Dairy, Northallerton.
 261 R. N.—MISS HARRISON, Galford Hall, Darlington.

Class 610.—Two Cleveland Cheeses.

- 265 I. (24.)—EAST ANGLIAN INSTITUTE OF AGRICULTURE, Chelmsford.
 266 II. (22.)—MRS. J. T. GARNETT, Street Farm, Loftus.
 267 III. (21.)—ROBERT NICKS, Stonebeck Gate Farm, Danby, Yorks.
 264 R. N.—JOSEPH CLEMMIT, Park Head Farm, Fryup, Leatholm.

Class 611.—Two Caerphilly Cheeses.

- 275 I. (24.)—UNITED DAIRIES (WHOLESALE), LTD., Wells.
 263 II. (22.)—CHEDDAR VALLEY DAIRY CO., LTD., Rooksbridge Factory, Axbridge.
 277 III. (21.)—WEST OF ENGLAND CREAMERY, Highbridge.
 269 R. N.—CUA AND SONS, The Creamery, Haverfordwest.
 H. C.—270. C.—274, 276.

Class 612.—Two Small Cheeses, not exceeding 6 lb. each, of Cheddar or Cheshire character.

- 280 I. (23.)—W. E. MOORE, Baddiley Farm, Nantwich.
 280 II. (22.)—MRS. EVELYN W. EVANS, Crickleaze House, Chard.
 284 III. (21.)—MARSHALL IRVING, Eardswick Hall, Church Minshull, Middlewich.
 H. C.—278, 282, 283. C.—279, 281, 287.

Class 613.—Two Small Cheeses, not exceeding 6 lb. each, of Stilton or Wensleydale character.

- 295 I. (23.)—MISS B. J. MUDD, Aldborough Dairy, Boroughbridge.
 300 II. (22.)—RILEY'S DAIRIES, LTD., 10, Campbell Street, Hull.
 304 III. (21.)—FRED WEBSTER, Shoby Priory, Melton Mowbray.
 296 R. N.—MISS RACHEL JAMES, Llanccayo, near Usk.
 H. C.—293, 303, 306. C.—291, 294, 305.

Class 614.—Two Soft Cheeses, made from Whole Milk.

- 309 I. (23.)—EAST ANGLIAN INSTITUTE OF AGRICULTURE, Chelmsford.
 310 II. (22.)—MISS E. J. MUDD, Aldborough Dairy, Boroughbridge.
 307 III. (21.)—MISS ELISIE G. COOK, Heath House, Tutswort.
 H. C.—313.

Awards of Prizes for Produce at Newcastle-on-Tyne, 1923. cxlvii

Class 615.—*Two Soft Cheeses, made from Cream, without the addition of Rennet.*

- 330 I. (23.)—MISS M. R. GORDON, 51A, Ashby Road, Loughborough.
 339 II. (22.)—MES. J. T. GARRETT, Street Farm, Loftus.
 323 III. (21.)—MISS JEAN MACGILLIVRAY, Gay Bowers Farm, Danbury, Chelmsford.
 324 R. N.—MISS B. J. MUDD, Aldborough Dairy, Boroughbridge.
 H. C.—317.

Cider.

Class 616.—*Six Bottles of Dry Cider, made in 1922.*

- 338 I. (23) & 337 II. (22.)—QUANTOCK VALE CIDER CO., LTD., North Petherthon, Bridgewater.
 329 III. (21.)—JOHN W. DAVIES, Red House, Michel Troy, Monmouth.
 339 R. N.—HEMBERT J. DAVIS, Goldsborough Farm, Sutton Mounts, Sparkford.

Class 617.—*Six Bottles of Sweet Cider, made in 1922.*

- 340 I. (23) & 341 III. (21.)—SIR IAN HEATCOAT AMORY, BT., Knights Hayes Court, Tiverton.
 350 II. (22.)—PULLIN BROTHERS, Compton Greenfield, Bristol.

Class 618.—*Six Bottles of Cider, made previous to 1922.*

- 355 I. (23.)—SIR IAN HEATCOAT AMORY, BT., Knights Hayes Court, Tiverton.
 365 II. (22) & 364 III. (21.)—JOSEPH M. PARRY & CO., LTD., Leominster.

Wool.¹

Of 1923 Clip.

Class 619.—*Three Fleeces of Oxford Down Wool.*

- 371 I. (23) & 372 II. (22.)—HUGH W. STILGOE, The Grounds, Adderbury, Banbury.

Class 620.—*Three Fleeces of Shropshire Wool.*

- 374 I. (23) & 375 II. (22.)—E. CRAIG TANNER, Eytton-on-Severn, Cross Houses, Salop.
 373 III. (21.)—NORMAN J. NUNNERLEY, Fern Hill House, Market Drayton.

Class 621.—*Three Fleeces of Southdown Wool.*

- 378 I. (23) & 379 II. (22.)—LADY LUDLOW, Luton Hoo, Luton.
 381 III. (21) & 380 R. N.—J. PIERPONT MORGAN, Wall Hall, Aldenham, Watford.

Class 622.—*Three Fleeces of Hampshire Down Wool.*

- 383 I. (23) & 382 II. (22.)—WILLIAM TODD, The Grange, Little Ponton, Grantham.

Class 623.—*Three Fleeces of Suffolk Wool.*

- 387 I. (23.)—FREDERICK M. L. SLATER, Weston Colville, Cambridge.
 386 II. (22.)—CAPT. L. W. MEADE, Earsham Hall, Bungay.
 384 III. (21.)—J. S. CARLTON, White Hall, Sudbury, Suffolk.

Class 624.—*Three Fleeces of Dorset Horn Wool.*

- 389 I. (23) & 390 II. (22.)—ALFRED READ, Lower Farm, Hilton, Blandford.
 388 III. (21.)—THE EARL OF ELGIN, C.M.G., Broomhall, Dunfermline.

Class 625.—*Three Fleeces of Ryeland Wool.*

- 396 I. (23) & 397 II. (22.)—DAVID J. THOMAS, Tulachdu, Brecon.
 395 II. (21.)—JOHN Q. ROWETT, Ely Place, Frint, Sussex.
 R. C.—393.
 C.—394.

Class 626.—*Three Fleeces of Leicester Wool.*

- 401 I. (23.)—T. H. HUTCHINSON, Manor House, Catterick.
 402 II. (22.)—ROBERT AND JOHN J. PIRSON, Tanton Farm, Stokesley.
 403 III. (21.)—C. H. SIMPSON AND SONS, Castle House, Hummaby.
 400 R. N.—JOHN W. HARRISON, Underpark, Leatholm.
 H. C.—399.
 C.—398.

Class 627.—*Three Fleeces of Border Leicester Wool.*

- 404 I. (23.)—W. J. GLAHOKE, Little Houghton, Lesbury.
 405 II. (22.)—R. G. MURRAY AND SON, Spittal, Biggar.

¹ The Second and Third Prizes in Classes 619 to 623 were given by the respective Flock Book Societies.

cxlviii *Awards of Horticultural Prizes at Newcastle-on-Tyne, 1923.*

Class 628.—Three Fleeces of Wensleydale Wool.

- 408 I. (£3.)—RICHARD CHESTER, Low Moor Farm, Ripon.
 409 II. (£2.)—T. E. CLARKE, Chalfan Hall, Silverdale.
 411 III. (£1.)—J. W. GREENSET, Holme-on-Swale, Thirsk.
 412 R. N.—JOHN HARGRAVE, Wath, Ripon.

Class 629.—Three Fleeces of Kent or Romney Marsh Wool, from Rams of any age.

- 418 I. (£3.) & 417 III. (£1.)—L. H. AND G. W. FINN, Westwood Court, Faversham.
 415 II. (£2.)—ARTHUR FINN, Westbrooke House, Lydd.
 420 R. N.—J. EGBERTON QUESTED, The Firs, Cheriton, Kent.

Class 630.—Three Fleeces of Kent or Romney Marsh Wool, from Ewe Tegs.

- 421 I. (£3.)—L. H. AND G. W. FINN, Westwood Court, Faversham.
 422 II. (£2.)—THE EARL OF GUILFORD, Waldershare Park, Dover.
 423 III. (£1.)—J. EGBERTON QUESTED, The Firs, Cheriton, Kent.

Class 631.—Three Fleeces of Kent or Romney Marsh Wool, excluding Rams and Ewe Tegs.

- 430 I. (£3.)—R. STANLEY STROUDS, Singleton Manor, Great Chart, Ashford, Kent.
 426 II. (£2) & 427 R. N.—L. H. AND G. W. FINN, Westwood Court, Faversham.
 428 III. (£1.)—THE EARL OF GUILFORD, Waldershare Park, Dover.

Class 632.—Three Fleeces of Cotswold Wool.

- 431 I. (£3.)—WILLIAM GARNE, Abington, Fairford.
 432 II. (£2.)—F. W. P. MATTHEWS, Fildred, Oxford.

Class 633.—Three Fleeces of Exmoor Horn Wool.

- 436 I. (£3.)—D. J. TAPP, Highercombe, Dulverton.
 435 II. (£2) & 434 III. (£1.)—T. C. PEARSE, Leigh Farm, Dulverton.

HORTICULTURAL EXHIBITION.

Class 1.—Groups of Miscellaneous Plants.

- 1 I. (£45.)—JAMES CYPHER AND SONS, Cheltenham.
 2 II. (£40.)—W. A. HOLMES, West End Nurseries, Chesterfield.

Class 2.—Collections of Orchids.

- 4 I. (£12.)—STEWART LOW AND CO., Bush Hill Park, Enfield.

Class 3.—Collections of Delphiniums.

- 5 I. (£8.)—BLACKMORE AND LANGDON, Bath.

Class 4.—Groups of Tuberous Begonias in Pots.

- 8 I. (£30.)—BLACKMORE AND LANGDON, Bath.

Class 5.—Collections of Hardy Perennial Plants and Cut Blooms.

- 13 I. (£30.)—T. A. LAWRENSON, Gosforth, Newcastle-on-Tyne.
 10 II. (£25.)—HARKNESS AND SONS, Bedale.
 9 III. (£20.)—GIBSON AND CO., Leeming Bar, Bedale.
 12 R. N.—W. ARDINDALE AND SONS, Nether Green Nurseries, Sheffield.

Class 6.—Collections of Cut Sprays of Tree Carnations.

- 14 I. (£15.)—C. ENGELMANN, Saffron Walden.
 15 II. (£10.)—STEWART LOW AND CO., Bush Hill Park, Enfield.

Class 7.—Collections of Cut Sprays of Border Carnations.

- 16 I. (£15.)—H. LAKEMAN, Thornton Heath.

Class 8.—Collections of Sweet Peas.

- 18 I. (£10.)—ROBERT BOLTON AND SON, Halstead.
 17 II. (£8.)—E. W. KING AND CO., Coggeshall, Essex.
 19 III. (£6.)—J. STEVENSON, Winborne.

Class 9.—Collections of Cut Roses.

- 21 I. (£15.)—ELISHA J. FICKS, Hufat, Herts.
 20 II. (£10.)—A. J. ALLAN AND CO., Bowthorpe Nurseries, Norwich.

Awards of Horticultural Prizes at Newcastle-on-Tyne, 1923. cxlix

Exhibits not for Competition.

Large Gold Medals to :—

ALLWOOD BROS., Wivelsfield Nurseries, Haywards Heath. Carnations.
BAKERS, Cobwell, Wolverhampton. Herbaceous Flowers and Model Garden.
BROADHEAD & SON, Thomsbridge, Huddersfield. Rock Garden.
ROBERT BOLTON & SON, Hatfield. Sweet Peas.
DOBIE & CO., LTD., Edinburgh. Sweet Peas.
ALEX. DICKSON & SONS, Howmark, Newtownards, Ireland. Sweet Peas.
ALEX. DICKSON & SONS. Cut Roses.
SUTTON & SONS, Reading. Vegetables, Fruit and Flowers.
KEST & BRYDON, LTD., Durlington. Shrubs and Cut Blooms.
T. A. LAWRENSON, Gosforth, Newcastle-on-Tyne. Dural Garden Design.

Gold Medals to :—

JOHN FORBES, HAWICK, LTD., Buccleuch Nurseries, Hawick, N.B. Philoxes, Penstemons and Violets.
JANG & MATHER, Kelso, N.B. Annuals and Vegetables.
H. LAKEMAN, Thornton Heath. Cut Border Carnations.
R. V. ROGER, Pickering. Clipped Trees and Alpines.
EDWARD WEBB & SONS, Wordsley, Stourbridge. Sweet Peas.

Silver-Gilt Medals to :—

R. H. BATH, LTD., Wisbech. Peonias and Delphiniums, etc.
MISS WORTH, The Priory, Holbeach. Cacti and Succulents.

Silver Medals to :—

B. R. CANT & SONS, Old Rose Gardens, Colchester. Roses.
H. ELLISON, Bull Street, West Bromwich. Ferns, Palms, and Cacti.
GODFREY & SONS, Exmouth. Herbaceous Flowers, Canterbury Bells and Pelargoniums.
JARMAN & CO., Chard. Roses, etc.
DOD BROTHERS, West Chorton, North Shields. Miscellaneous Group of Greenhouse Plants.
MISS S. S. THOMSON, Alfred Road, Handsworth, Birmingham. Cacti.

PRINCIPAL ADDITIONS TO THE LIBRARY.

[The name of the donor, or the mode of acquisition, appears in *Italics* after the title of each work.]

- ASHBY, A. W. and BYLES, P. G. Rural Education. Oxford, 1923. *Mr. C. S. Orwin*
- BRENCHLEY, W. E. Manuring of Grass Land for Hay. London, 1924. *Purchased*
- BRITISH PERCHERON HORSE SOCIETY. Stud Book, Vol. I. London, 1922. *Society*
- BROWN, E. Poultry Keeping on the Farm. London, 1923. *Publishers*
- BURRITT, M. C. Apple Growing. New York, 1923. *Publishers*
- CANADA: Natural Resources and Commerce. Ottawa, 1923. *Canadian Govt.*
- CHASE, Agnes. First Book of Grasses. New York, 1922. *Publishers*
- CLARK, G. H., and FLETCHER, J. Farm Weeds of Canada. 2nd edition revised and enlarged by G. H. CLARK, Ottawa, 1909. *Mr. E. H. Godfrey*
- CLARK, G. H., and MALTE, M. Oscar. Fodder and Pasture Plants. Ottawa, 1913. *Mr. E. H. Godfrey*
- CLARK, J. A., MARTIN, J. H., and BALL, C. R. Classification of American Wheat Varieties (U.S. Dept. of Agric. Bulletin, No. 1074, Professional Paper).
- COBURN, F. D. The Book of Alfalfa. New York, 1918. *Sir Merrik Burrell*
- COCKERHAM, K. L. A Manual for Spraying. New York, 1923. *Publishers*
- CORBETT, L. C. Intensive Farming. New York, 1923. *Publishers*
- ENCYCLOPEDIA of Veterinary Medicine, Surgery and Obstetrics. Edited by G. H. WOOLDRIDGE. 2 Vols. London, 1923. *Purchased*
- FARMER'S PROBLEM (The). By A Farmer. London, 1923. *Publishers*
- FIELDING, Sir Charles. Food. London, 1923. *Mr. C. S. Orwin*
- FLEMING, George. A Text Book of Veterinary Obstetrics. 3rd edition revised and modified by J. F. CRAIG, M.A., M.R.C.V.S. London, 1918. *Purchased*
- FREEMAN, Ella M. A Home Vegetable Garden. New York, 1922. *Publishers*
- GARDINER, R. Strachan. The Agricultural Landowner's Handbook on Taxes, Rates and Tithe (England and Wales). London, 1923. *Association*
- GOURLEY, J. H. Text Book of Pomology. New York, 1922. *Publishers*
- HALL, Sir A. Daniel. Agriculture after the War. London, 1920. *Purchased*
- HALNAN, E. T. Animal Nutrition. London, 1923. *Publishers*
- HELSEB, M. D. Farm Meats. New York, 1923. *Publishers*
- HOOLEY, Will. Poultry Craft. London, 1923. *Purchased*
- INSTITUTE OF AGRICULTURAL ECONOMICS. Miscellaneous Papers. Vol. II. Oxford, 1923. *Institute*
- JOURNAL OF AGRICULTURAL SCIENCE. Vols. X, XI and XII, Cambridge, 1920-22. *Purchased*
- LANDER, G. D. Veterinary Toxicology. London, 1912. *Purchased*
- LINTON, R. G. Veterinary Hygiene. Edinburgh, 1921. *Purchased*

Principal Additions to the Library.

cli

- LYON, T. L., and BUCKMAN, H. O. *The Nature and Properties of Soils.* New York, 1922. *Publishers*
- MACKINTOSH, JAMES. *Dairy Cattle.* London, 1923. *Publishers*
- MALDEN, W. J. *Grassland Farming.* London, 1924. *Publishers*
- MIDDLETON, Sir Thomas H. *Food Production in War.* Oxford, 1923. *Mr. C. S. Orwin*
- MINISTRY OF AGRICULTURE AND FISHERIES. *The Construction of Cow-Houses, with Plans.* 1923. *Purchased*
- NICHOLS, Noll B. *The Farm Cook and Rule Book.* New York, 1923. *Publisher.*
- PERCIVAL, John. *The Wheat Plant.* London, 1921. *Purchased*
- Pigs. *Outdoor Pigs. How to Make them Pay.* By the leading authorities on Modern Pig Keeping. London, 1923. *Publishers*
- POTATOES. *List of Names of all known varieties of the Potato, together with their Synonyms.* Typescript prepared by the Board of Agriculture for Scotland. 1923. *Purchased*
- PUNNETT, R. C. *Heredity in Poultry.* London, 1923. *Publishers*
- PURVIS, G. H. *Agricultural Implements.* London, 1923. *Publishers*
- PUTNAM, G. E. *Supplying Britain's Meat.* London, 1923. *Purchased*
- RAMSBOTTOM, John. *A Handbook of the Larger British Fungi.* London, 1923. *Trustees of British Museum*
- REYNOLDS, M. H. *Veterinary Studies for Agricultural Students.* 8th edition. New York, 1922. *Publishers*
- ROEBUCK, A. *Insect Pests and Fungous Diseases of Farm Crops.* London, 1923. *Publishers*
- ROTHAMSTED EXPERIMENTAL STATION. *Report for 1921-22, with the Supplement to the "Guide to the Experimental Plots."* Harpenden, 1923. *Director*
- RUSSELL, Sir John. *Farm Soil and its Improvement.* London, 1923. *Publishers*
- and members of the Biological Staff of the Rothamsted Experimental Station. *The Micro-organisms of the Soil.* London, 1923. *Purchased*
- SHORTHORN SOCIETY. *Shorthorn Breeders' Guide,* 1924. *Society*
- SMITH, Maj.-Gen. Sir F. *A Manual of Veterinary Physiology.* 5th edition. London, 1921. *Purchased*
- UNITED STATES Dept. of Agriculture *Year Book,* 1908, 1909, 1911-1913, 1916-1922. *Department*
- VENN, J. A. *Foundations of Agricultural Economics.* Cambridge, 1923. *Purchased*
- WALLACE, Robert. *Live Stock of Great Britain.* 5th edition. Edinburgh, 1923. *Purchased*
- WARDLE, R. A., and BUCKLE, P. *The Principles of Insect Control.* Manchester, 1923. *Purchased*
- WOOL, Leslie S. *The Principles and Practice of Farm Valuations.* 4th edition, revised. London, 1923. *Purchased*

PARLIAMENTARY PAPERS.

Agricultural Credit.

REPORT of Committee on Agricultural Credit. Cd. 1810. 1923.

Agricultural Produce.

INTERIM Reports on Milk and Milk Products (Cd. 1854, 1923); Fruit and Vegetables (Cd. 1892, 1923); Meat, Poultry and Eggs (Cd. 1927, 1923); Cereals, Flour and Bread (Cd. 1971, 1923); and Final

Report (Cd. 2008, 1924) of the Departmental Committee on the Distribution and Prices of Agricultural Produce.

Agriculture.

FIRST Interim Report (Cd. 1842) and Second Interim Report (Cd. 2062) of the Agricultural Tribunal of Investigation, 1923.

REPORT on the work of the Intelligence Department of the Ministry of
• Agriculture and Fisheries for the two years 1910-1921, 1922.

Meat Inspection.

REPORT of the Departmental Committee on Meat Inspection, 1921.

Northern Ireland.

FIRST Annual Report of the Ministry of Agriculture for Northern Ireland, 1923.

The Society is indebted to numerous Government Departments, both at home and abroad, to Boards of Agriculture, Agricultural and Breed Societies and kindred institutions, for copies of their Annual Reports, Journals, Stud, Herd, and Flock Books, Proceedings, Transactions, Bulletins, and other documents received regularly for the library in exchange for copies of the Journal, as well as to the Editors of many agricultural and general papers for the current numbers of their publications, which are placed for reference in the Reading Room.

INDEX TO VOLUME 84.

1923.

The titles of Articles are printed in Italics. The Roman numerals refer to the Appendix.

ACCOUNTS, ^{ACC} Presentation of, 314, 1.
 Acid Soil Experiments at Woburn, 164
 Acreage under Crops and Grass in United Kingdom, 211, 223, 224
 Admissions by payment at Newcastle Show, 247
 Agricultural (Amendment) Act, 1923, 199
 Agricultural Credits Act, 1923, 201
Agricultural Education Exhibit, Newcastle, 1923, 279-284
 Agricultural Holdings Act, 1923, 199
 Agricultural Holdings (Scotland) Act, 1923, 200
 Agricultural Rates Act, 1923, 202
 Agricultural Relief of Allies Committee, 371-380
 Agricultural Research, medal for, 239, 324
Agricultural Statistics, 1923, 211-230
 "Alfalfa, The Book of," by F. D. Coburn, 238
 Alsike Clover, 18
 Amos (Arthur), *The Silage Content of Tower Silos and Silage Clamps*, 50-60
 Analyses of Silage, 48, 49
 Animal Diseases in 1923, 320
Annual Report for 1923 of the Botanist, 358-362
 — for 1923 of the Consulting Chemist, 347-358
 — for 1923 of the Principal of the Royal Veterinary College, 336-347
 — for 1923 of the Zoologist, 362-371
 Anthrax, 336
 Aphis Attacks, 369

^{BEN}
 Argentine Rural Society, Judges for Show at Palermo, 318
 Armstrong Colleges' Exhibit at Newcastle Show, 282
 Arsenic, Absorption of by Crops, Experiments on at Woburn, 149
 — Experiments with at Woburn, 161
 — in Hops, 357
 Auditors, Election of, liv
 Awards of Prizes at Newcastle Show, lvii

BALANCE Sheet, 1923, Ordinary, xvi
 — Newcastle Show, x
 Barley, Experiments on Continuous growing of at Woburn, 118
 — Produce, Acreage and Yield per acre of, in United Kingdom, in 1922 and 1923, 212, 213, 223, 224
 — Variety Yield Tests with, 169
 — Varieties of, grown at Woburn, 137
 Barium Experiments at Woburn, 161
 Basic Slag, 352
 Beans and Peas as crop for ensilage, 43
 — and Tares as crop for ensilage, 43
 — Produce, Acreage and Yield per Acre of, in United Kingdom, in 1922 and 1923, 212, 215, 223, 224
Beef Production, 60-72
 Bennett (W. H.), *The Fur stag Exhibition at the Newcastle Show*, 1923, 285-291
 Bent Grasses or Fiorin, 12

- BIF
- Biffen (Prof. R. H.), *Annual Report for 1923 of the Botanist*, 358-362
- "Big bud" in black currants, 369
- Birdsfoot Trefoil, 18
- Black Currant gall-mite, 369
- Bond, J. R., "Farm Implements and Machinery," 236
- "Book of Alfalfa, The," by F. D. Coburn, 238
- Boron experiments at Woburn, 160
- Botanical Department, Work of, during year, 319
- Botanist, Annual Report of, 358
- Broad Red Clover, 17
- Brome, Grasses, 16
- Bullock-feeding experiments at Woburn, 161
- Burkitt (William), Miscellaneous Implements exhibited at the Newcastle Show, 1923, 248-260
- Burnet, 18
- Busvan, 259
- Butter-making Machine or Churn, 258
- Butter, Prices of in 1923, 219
- Tests at Newcastle Show, 269
- Bye-Laws, revision of, xxiv, xlvii
- CÆSIUM
- Cæsium Experiments at Woburn, 159
- Calf-rearing Experiments at Woburn, 156
- Cattle, Importation of Breeding, 322
- Number of, in Great Britain in 1922 and 1923, 214, 223
- Pathology Medals, 325
- Prices of, in 1923, 218, 228, 229
- Cereal Meals, Offals, etc., 350
- Cereals, Insects attacks on, 363
- Cesium Experiments at Woburn, 159
- Chaff-cutter, 255
- Chalmers (W. S.) and Crowther (Charles), *The Merits of Home-Produced Foods for Pig-Feeding*, 174-198
- Chaplin, Death of Viscount, 312, xxix
- Cheese experiments in Dairy at Newcastle Show, 276
- Prices of, in 1923, 219
- Chemical Department, Work of, during year, 319
- CHE
- Chemist, Annual Report of Consulting, 347-358
- Chicory, 18
- Chocolate Refuse, 361
- Chromium experiments at Woburn, 161
- Churning, Experiments on Different Methods of, 274
- Clamp silage, 57
- Clarke, Sir Ernest, 1-10
- Death of, 312, xxii
- Clover, as crop for ensilage, 45
- Crimson, grown at Woburn, 142
- enquiries in botanical department, 360
- Clovers and Grasses, experiments with at Woburn, 138
- Coburn, F. D., "The Book of Alfalfa," 238
- Cockle Park, Visit to, 315, xxvii, xxix
- Cocksfoot, 12
- Colling, Brothers, Challenge Cup, presentation of, 245, xxiv
- Combined Swath Turner and Side-delivery Rake, 256
- Committees, List and Members of Standing, iii-v
- Comparative Statement of Entries at last two Newcastle Shows, 243
- Compound Cakes and Meals, 350
- Contagious Abortion in Mares, 347
- Contemporary Agricultural Law*, 196-211
- Continuous Growing of Barley, experiments at Woburn, 113
- of Wheat, experiments at Woburn, 116
- Copper experiments at Woburn, 160
- Corn, "Head" and "Tail," experiments at Woburn, 166
- Prices of British, 217, 226, 227
- saw-fly, 363, 368
- Cotton Cake, 349
- Couch Grass, or Twitch, 16
- Council, Annual election of, 314
- Elections to, liv
- List of, i
- Meetings in 1923, Minutes of, xx
- Changes on, in 1923, 313
- Cows and Heifers in Milk, and in Calf, number of in Great Britain in 1922 and 1923, 223
- Crane, Electric, 257
- Creeping Bent, 12

- CREE
 Crested Dogtail, 12
 Crimson Clover, grown at Woburn, 142
 Crops and Grass, Acreage under, 211, 223
 — Experiments with varieties of at Woburn, 136
 — Inoculation of, Experiments at Woburn, 144
 — Produce, Acreage, and Yield per Acre in 1922 and 1923, 224, 225
Crops for Ensilage, 39-49
 Crowther (Charles) and Chalmers (W.S.), *The Merits of Home-Produced Foods for Pig-Feeding*, 174-198
 Cultivator, Notes, 257
- DAIRYING, Report of the Steward of, at Newcastle Show, 260-279
 Darnel Grass, 15
 Deaths of Governors and Members during year, 312, 313
 Decorticated Cotton Cake and Meal, 349
 Diacyanodiamide experiments at Woburn, 163
 Disc Harrow, 257
 Distribution and Prices of Agricultural Produce, 324
 Dry feeders for Pigs, 259
 Duck-keeping, 107
- EADIE, Death of Mr. John T. C., 312, xl
Economical Adjustment of Air Space in Cow-Sheds, *The*, 73-78
 Eggs, Prices of in 1923, 219
 Electric Crane, 257
 Electrical exhibits by Mr. R. Borlase Matthews at Newcastle Show, 255
 Elliot's Mixtures, 127
 Ensilage, Experiments on, at Woburn, 132
 Entries for Newcastle Show, 242, 243
 "Equipment for the Farm and the Farmstead," by H. C. Ramsomer, 237
 Estate Nurseries Competition, 1923, 302
 Examinations for N.D.A. and N.D.D., Results of, 320, 331
- GEN
 Expenditure and Receipts at Newcastle Show, x
 Experiments in Dairy at Newcastle Show, 274
Experiments with Cereals in Norfolk, 166-173
 Export of British Live Stock, 323
 — of Horses, 322, xxv
 "FARM Implements and Machinery," by J. R. Boud, 236
 Farmers' Milk Competition, 260
 Farmyard Manure Experiments at Woburn, 131, 145
 Fat Stock, Price of, in 1923, 218, 228, 229
 Feeding Experiments at Woburn, 150
 — Stuffs, 348
 Felspar, experiments with at Woburn, 163
 Fen Soils, Experiments on at Woburn, 161
 Fertilisers, 351
 — and Feeding Stuffs Act, amendment of, 319, 348
 Finance Act, 1923, 200
 Financial Statement by Chairman of Finance Committee, vii, ix
 "Finger and Toe" in Swedes, experiments on the prevention of at Woburn, 143
 Fireproof Waterproof Threshing Tackle, 254
 Fish Meal, 350
 Fluorides, experiments with at Woburn, 162
 "Food Production in War," by T. H. Middleton, 231
 Foot and Mouth Disease, 342
 — Discussion on, xlv
Forestry Exhibition at the Newcastle Show, 1923, The, 285-291
 "Foundations of Agricultural Economics," by J. A. Venn, 233
 Foxtail, 13
 Frit-fly, 363, 364
 Fruit, Insect attacks on, 369
 — Prices of, in 1923, 219
 Funds in Trust held by Society, xix
 Fungoid Diseases, 361
- GENERAL Meeting, Report of Council to, December 12, 1923, 312-325; Proceedings at, xlviii

GEN

- General Meeting in Newcastle Show-yard, Proceedings at, xxxi
 Glanders, 337
 Glossop (W. G. V.), *The Economical Adjustment of Air Space in Cow-Sheds*, 73-78
 Gold Medal for Agricultural Research, 239
 Goodwin (J. P.), *The Work of the Agricultural Relief of Allies Committee*, 371-380
 Gorse grown at Woburn, 141
 Gout-fly, 363, 364
 Governors of the Society, Distribution of, vi
 — Deaths during year, 313
 — Number of, since Establishment of Society, vii
 Grass as crop for ensilage, 47
 — Land, Experiments on, at Woburn, 127
 Grass-Land Problems, 359
 Grasses, Experiments with at Woburn, 138
 Green-manuring Experiments at Woburn, 124
 Greensoiling, 30
 Ground Mineral Phosphate, 352

- H**ARD Fescue, 13
 Harrow Self-cleaning Pitch Pole, 252
 "Hartington," S.S., Incident, 321, xxiv
 Hay, Prices of in 1923, 219
 — Produce, Acreage and Yield per Acre of, in United Kingdom, in 1922 and 1923, 213, 216, 223, 225
 Heigham (C.), *Experiments with Cereals in Norfolk*, 166-173
 Hessian-fly, 363
 Hills' Experiments at Woburn, 158
 Hop Refuse, 353
 Hops, Prices of in 1923, 219
 — Total Produce, Acreage and Yield per Acre, in 1922 and 1923, 213, 217, 223, 225, 226
 Horses, Export of, 322, xxv
 — Number of, in Great Britain in 1922 and 1923, 214, 223
 House (C. A.), *Poultry-Keeping on the Farm*, 93-110
 Humogen, 144

- I**MPLEMENT Yard at Newcastle Show, Amount of Shedding in, 242

LIM

- Implements exhibited at Newcastle Show, 248
 Importation of Breeding Cattle, 322, xxxix
 Imports of Agricultural commodities in 1923, 219, 230
 Income Tax, Society's Appeal against, 314, xxvii, xxx
 Inoculation of Crops, Experiments at Woburn, 144
 Iodine and Bromine experiments at Woburn, 159
 Iron, sulphate of, experiments at Woburn, 161
 Italian Rye-grass, 15

- J**OHNE'S Disease, 347
 Joint Committee of British Live Stock Breeders, 318
 Judges at Argentine Show, 318

- K**ELLNER'S experiments, 63
 Kidney Vetch, 18
 Kiln-drying of Barley, experiments at Woburn, 148
 King's Premium Stallions, 87

- L**ABOUR, Agricultural Law Cases connected with, 203
 Landlord and Tenant, Law Cases, 205
 Lathyrus sylvestris grown at Woburn, 141
 Lawes and Gilbert's work on animals, 62, 63
 Lawn Mower Motor Pusher, 257
Laying Down of Land to Grass, The, 11-28
 Laying down pasture at Woburn, 127
 Lead experiments at Woburn, 159
 Leather Powder as a manure, experiments on at Woburn, 147
 Leicester Show, 1924, 316
 Leucite, experiments with, at Woburn, 163
 Library, Principal Additions to, cl
Light Horse Breeding, 79-93
 Lime, 355
 — and Magnesia in soils, experiments on at Woburn, 164
 Liming, experiments on at Woburn, 148
 — of Grass Land at Woburn, 120

- LIN
 Linseed Cake, 348
 Linseed grown at Woburn, 142
 List of Council, i
 Lithium, experiments with compounds of, at Woburn, 158
 Live Stock in Great Britain, &c.,
 Number of, in 1922 and 1923,
 214, 223
 Local Committee, Thanks to Newcastle, xxxvi
 Long Service Medals, xli, xlvii
 Lord Mayor and Corporation of
 Newcastle, Thanks to, xxxv
 Lucerne as crop for ensilage, 44
 --- experiments on, at Woburn, 139
 Lupins and Buckwheat as crop for
 ensilage, 47
- McFADYEAN (Sir John), *Annual Report for 1923 of the Principal of the Royal Veterinary College*, 336-347
 Magnesia for Mangels, experiments
 on at Woburn, 147
 --- for Potatoes, 147
 --- for Wheat, 147
 Maize as crop for ensilage, 45
 --- grown at Woburn, 142
 Manganese, experiments with salts
 of, at Woburn, 159
 Magnesium Chloride and Sulphate,
 experiments with at Woburn,
 163
 Mange, Parasitic, 339
 Mangels, experiments on late pulling
 • of, at Woburn, 149
 Mangolds, Produce, Acreage and
 Yield per Acre of, in United
 Kingdom, in 1922 and 1923,
 213, 216, 223, 225
 Manure Distributor, Waverley, 257
 Manurial Experiments at Woburn,
 145
 Mowing of Grass Land at Woburn,
 128
 Mathews (Ernest), *Report of the Steward of Dairying, Newcastle Show, 1923*, 260-279
 Medal for Agricultural Research,
 324
 Medals for Cattle Pathology, 325
 Meadow Barley Grasses, 16
 --- Fescue, 13
 --- Grasses, 14
 --- Out Grass, 15
 Members of Society, Distribution
 of, vi
- NOT
 Members, Deaths of, during year,
 313
 --- Numbers of, since Establishment
 of Society, vii
*Merits of Home-Produced Foods for
 Pig-Feeding, The*, 171-198
 Meteorological Office's Exhibit at
 Newcastle Show, 284
 Meteorological work at Woburn
 Farm, 166
 Middleton, Sir T. H., "Food Pro-
 duction in War," 231
 Milk Bottle Filling Machine, 258
 --- Filter, 259
 --- Prices of in 1923, 219
 --- Washing Machine, 258
 --- Yield Trials at Newcastle Show,
 cattle, 264; goats, 272, 273
 Milking Cows, Prices of, in 1923,
 218, 228, 229
 --- Machine, 259
 Minutes of Council Meetings in
 1923, xx
*Miscellaneous Implements exhibited
 at the Newcastle Show, 1923*,
 248-260
 Mowing or Grazing Experiments at
 Woburn, 139
 "Multipotent" Cutter, 253
- NATIONAL Diploma, Results
 of Examinations for, in
 Agriculture, 326; in Dairying,
 331
 National Institute for Research in
 Dairying, Exhibit at Newcastle
 Show, 283
 Naylor, Death of Mr. J. R., 312,
 xxii
 New Implements, 248
Newcastle Show, 1923, The, 240-248
 --- Attendance at, 247
 --- Awards of Prizes at, lvii
 --- Entries for, 242, 243
 --- Receipts and Expenditure at, x
 Nitrate of Soda, 353
 Nitro-cake and nitro-cake super-
 phosphate experiments at Wo-
 burn, 163
 Nitrogenous Top-dressings for Corn
 Crops, experiments on at Wo-
 burn, 146
 Nitrolim experiments at Woburn,
 163
 North-Eastern Secondary School's
 Exhibit at Newcastle Show, 289
Notes, Communications and Reviews,
 230-240

- OAT Grasses, 14
- Oats, Produce, Acreage and Yield per Acre of, in United Kingdom, in 1922 and 1923, 212, 215, 223, 224
- Varieties of grown at Woburn, 137
- Oatmeal Siftings, 350
- Officials of the Society, v
- Oldershaw (A. W.), *Crops for Ensilage*, 39-49
- Onion, wild, prevention of, 150
- Orchard and Fruit Plantation Competition, 306
- Ores, radio-active, experiments at Woburn, 162
- PARASITIC Mange in Horses, 339
- Peas, Produce, Acreage and Yield per Acre of, in United Kingdom in 1922 and 1923, 213, 216, 223, 224
- Peas and Oats as crop for ensilage, 44
- Peel (W. R.), *Stock Farming on Arable Land*, 29-38
- Perennial Ryegrass, 15
- Pettors' Patent Cold Starter, 251
- Phonolit, experiments with at Woburn, 163
- Pig-Feeding, experiments on, 174
- Pig Weigher and Loader, 259
- Pigs, Number of, in Great Britain, in 1922 and 1923, 215, 223
- Prices of, in 1923, 218, 228, 229
- Plantations and Estate Nurseries Competition*, 1923, 291-305
- Pot Culture Station at Woburn, The, 157
- Potash and Nitrogen for Potatoes, experiments on at Woburn, 146
- Potato Digger, 256
- Disease, prevention of, experiments at Woburn, 142
- Planter with artificial Manure Sower, 256
- Potatoes, Prices of in 1923, 219
- Produce, Acreage and Yield per Acre of, in United Kingdom, in 1922 and 1923, 213, 216, 223, 225
- Poultry-Keeping on the Farm*, 93-110
- Poultry Manure, 354
- Powdered Sewage Manure, 354
- President for 1924, 313, xxxix, lii
- Thanks to, at General Meetings, xxxvi, lv
- Principal Additions to the Library, cl
- Prize List for Leicester Show, 1924, 316, 317
- Proceedings at Annual General Meeting on December 12, 1923, xlviii
- at General Meeting in Newcastle Showyard, July 4, 1923, xxxi
- Produce, Acreage and yield per Acre in Principal Crops in United Kingdom in 1922 and 1923, 224, 225
- Farm, Law Cases concerning, 209
- Pumping Plant driven by Charcoal Gas Producer, 255
- Pure Seed production, 172
- QUARTER Evil, 347
- Queen Victoria Gifts Fund, Grants made by, 324, xxx
- RADIO-ACTIVE ores, experiments with at Woburn, 162
- Railway Companies, Thanks to, xxxvi
- Railway Fires Act (1905) Amendment Act, 1923, 200
- Ransomer, H. C., "Equipment for the Farm and the Farmstead," 237
- Receipts and Expenditure at Newcastle Show, x
- Ordinary, xiv
- Red Clovers, 17
- Reduction of Charges for Spare at Shows, 317, 318
- Refuse Materials, 353
- Rent and Mortgage Interest Restriction Act, 1923, 200
- Report of Council to General Meeting*, December 12, 1923, 312-325
- Report of Judges on the Orchard or Fruit Plantation Competition*, 1923, 306-311
- Report of Judges on the Plantations and Estate Nurseries Competition*, 1923, 291-305
- Report of the Steward of Dairying*, Newcastle Show, 1923, 260-279
- Report on the Forestry Exhibition at the Newcastle Show*, 1923, 285-291
- Reports of the Departmental Committee on Distribution and Prices of Agricultural Produce*, 230

- REF
- Reports on the Results of the Examinations in 1923, National Diploma in Agriculture*, 326;
National Diploma in Dairying, 331
- Research Committee, work of during year, 323
- Receipts and Payments for 1923, xviii
- Research, Gold Medal for Agricultural, 239
- Research Work by the Society in 1923*, 166-198
- Rib Grass, 18
- Richardson (Charles), *Light Horse Breeding*, 79-93
- Road Roller with Scarifier, 255
- Roots, enquiries on in Botanical Department, 360
- Rotary Pump, 254
- Rotation Experiments at Woburn, 120
- Rough-stalked Meadow Grass, 14
- Royal Veterinary College, Annual Report for 1923 of the Principal of the, 336-347
- Rye, Acreage of in 1922 and 1923, 212
- Ryegrasses, 16
- SAINFOIN, varieties of grown at Woburn, 137
- Salt for Mangels, experiments on at Woburn, 146
- Seed Drill, Dunn's, 259
- Self-Cleaning Pitch Pole Harrow, 252
- Sewage Sludge, experiments at Woburn on Manurial value of, 149
- Sheep-feeding experiments at Woburn, 153
- Sheep, Number of, in Great Britain in 1922 and 1923, 214, 223
- Prices of, in 1923, 218, 228, 229
- Sheep Scab, 321, 337
- Sheep's Fescue, 13
- Silage, Analyses of, 48, 49
- Silage Content of Tower Silos and Silage Clamps, The*, 50-60
- Silicates, experiments with at Woburn, 162
- Silos, 31
- Silver Medals awarded to New Implementants at Newcastle Show, 249
- Sir Ernest Clarke*, 1-10
- Smooth-stalked Meadow Grass, 14
- TM
- "Smut" in Wheat, experiments to prevent at Woburn, 165
- Society's Gold Medal for Agricultural Research, The, 239
- Sodium experiments at Woburn, 160
- Soils, 356
- Somerville (Prof. W.), *The Laying Down of Land to Grass*, 11-28
- Soot, 353
- Soya Bean grown at Woburn, 142
- Spencer (Aubrey J.), *Contemporary Agricultural Law*, 199-211
- Squirrel-tail, 16
- Standing Committees, List and Members of, iii-v
- Stanley (R. E.), *Agricultural Statistics*, 1923, 211-230
- Statement made to the Council by Chairman of Finance Committee on accounts, viii
- Statistics, Agricultural, 211-230
- Stem-rot-worm, 363, 369
- Stock, Farm, Law Cases connected with, 204
- Stock-Farming on Arable Land*, 29-38
- Strontium experiments at Woburn, 160
- Sugar-beet grown at Woburn, 141
- Sulphur experiments at Woburn, 162
- Sunflowers for silage, 46
- Superphosphate, 351
- Swainson Pump, 255
- Swath Turner, 254
- Swath-Turner and Side-delivery Rake, Combined, 256
- Swedes, Produce, Acreage and Yield per Acre of, in United Kingdom, in 1922 and 1923, 213, 216, 223, 225
- Varieties of grown at Woburn, 137
- Swedish Agricultural Show, 324, xxix
- Sweet-scented Vernal, 16
- Swine Fever, 338
- Erysipelas, 340
- TALL Fescue, 13
- Oat Grass, 14
- Tarbutt's Positive Milk Holder, 257
- Temperature Controller, 258
- Threshing Machine combined with Grinding Mill, 254
- with Stack-feeder, 249
- Timothy, 15

- TIN
- Tin, compounds of, experiments at Woburn, 161
- Tower Silos, 52
- Tractor Subsoiler, 253
- Saunderson, 256
- Trailer, two-wheeled, 256
- Trefoil, or Yellow Clover, 18
- Trust Funds held by the Society, xix
- Trustees, Election of, liii
- List of, i
- Turner (T. B.), *The Newcastle Show*, 1923, 240-248
- Turnip and Mangold Drill, 254
- Turnips, Produce, Acreage and Yield per Acre of, in United Kingdom in 1922 and 1923, 213, 216, 223, 225
- Tussock Grass, or Bull's Snouts, 16
- UNEXHAUSTED Manure Value of Cake and Corn, The, 120
- VEAL, Calves, Prices of in 1923, 228, 229
- Venn, J. A., "Foundations of Agricultural Economics," 233
- Veterinary Department, Work of, during year, 320, 321
- Report, Annual, 336
- Vice-Presidents, Election of, liv
- List of, i
- Voelcker (Dr. J. A.), *Annual Report for 1923 of the Consulting Chemist*, 347-358
- *Sir Ernest Clarke*, 1-10
- *The Woburn Experimental Farm and its Work (1876-1921)*, 110-166
- WALES, H.R.H. the Prince of, visit to Newcastle Show, 244, xxxi
- Warburton (Cecil), *Annual Report for 1923 of the Zoologist*, 362-371
- WOOD
- Wood Prevention, experiments at Woburn, 149
- Weeds, 362
- Wheat-bulb fly, 363, 366
- Experiments on Continuous growing of at Woburn, 116
- Granulator and Cutter, 256
- "Hard" and "Soft," experiments on at Woburn, 165
- midge, 363, 367
- Produce, Acreage and Yield per Acre of, in the United Kingdom, in 1922 and 1923, 212, 215, 223, 224
- Thick and Thin sowing of, experiments at Woburn, 149
- Varieties of grown at Woburn, 136
- White, or Dutch, Clover, 17
- Wild Onion, prevention of, 150
- White Clover, 17
- Woburn Experimental Farm and its Work, The*, 110-166
- Wood (Prof. T. B.), *Beef Production*, 60-72
- Wools, Collection of, at Leicester Show, 1924, 318
- Workmen's Compensation Act, 1923, 203
- Work of the Agricultural Relief of Allies Committee, The*, 371-380
- YARROW, 18
- Yellow Oat Grass, 14
- York, H.R.H. The Duke of, congratulations to on betrothal, 325, xx
- Yorkshire Fog, 17
- ZIG-ZAG Clover, 17
- Zinc experiments at Woburn, 159
- Zoological Department, Work of, during year, 320
- Zoologist, Annual Report of, 362-371

